

INDEX COPEIA, 2003, NOS. 1-4

NEW NAMES

Apareiodon
 argenteus 337-348
 cavalcante 337-348
 tigrinus 337-348
Cichlasoma *scitulum* 794-802
Creagrutus *tuyuka* 583-584, 586
Cyphotilapia *gibberosa* 824-829, 831
Emblemaria *australis* 95-98
Engyprosopon *mozambiquensis* 834-836
Essele nichthys 414
Etheostoma
 basilare 517-528, 530
 cervus 576-582
 derivativum 517-528, 530
Gambusia *clarkhubbsi* 783-788
Halichoeres *socialis* 124-130
Hisonotus *insperatus* 588-593
Liparis *adiastolus* 818-823
Lithogenes *valencia* 562-575
Lumpenopsis *cliella* 803-809
Mystus *impluviatus* 373-378
Pachycara
 andersoni 357-364
 arabica 358-364
Phrynohyas *lepidia* 379-382
Plethodontohyla *coronata* 789-793
Syphurus *bathysphilus* 810-817

NEW AND ESTABLISHED NAMES

Abudefduf
 abdominalis 438, 451
 sordidus 451
Acanthaceae 592
Acanthemblemaria 242
 maria 98
 spinosa 241-247
Acanthocibium *solandri* 433-454
Acanthodactylus *erythrurus* 202, 408-413
Acanthuridae 439, 441-442, 445, 453, 458, 462, 464
Acanthurus
 achilles 439, 453, 458, 462
 blockii 453
 dussumieri 453, 458, 462
 leucosternon 458, 462
 lineatus 458, 462
 nigrofucus 453, 458, 462
 nigroris 439, 440, 453
 olivaceus 458, 462
 thompsoni 453
 trigostegus 439, 446, 453
Acari 644-645
Acariformes 635-645
Acipenser 682-683
 brevirostrum 682
 fulvescens 682
 medirostris 682
 oxyrinchus
 o. desotoi 683
 o. oxyrinchus 683
 transmontanus 682
Acropora 69
 palmata 241-247
Aequidenus *pallidus* 258
Agalychnis *spurrelli* 206
Agaricia 129
 tenuifolia 47
Aghistrodon
 contortrix 232-233, 236, 238
Albula
 glossodonta 451
 vulpes 843
Albulidae 441, 451
Alcichthys *alcicornis* 78
Alectis *ciliaris* 453
Alligator *sinensis* 874
Allolumpenus 803-809
 hypochromus 803-809
Alosa
 pseudoharengus 843
 sapidissima 840-841, 843
Alsophis *portoricensis* 84, 91
Aluterus *scriptus* 453
Amblycirrhitus *binacula* 453
Amblyraja *radiata* 933
Ambulacraria 918
Ambystoma 354
 barbouri 646
 californiense 711
 jeffersonianum 667
 macrodactylum 937
 maculatum 534, 622, 654, 887-893
 mexicanum 605, 862
 talpoideum 164, 622
 texanum 622, 891
 tigrinum 58, 601-607, 621, 705, 710-712
 t. nebulosum 56-67
 t. stebbinsi 601-607
Ambystomatidae 534, 887
Ameiurus 20-33
 brunneus 20-33
 catus 20-33
 macgregori 20
 melas 20-33, 278, 284
 natalis 20-33, 284

nebulosus 20–33
pectinatus 20
platycephalus 20–33
sauvagei 20, 29
seracanthus 20–33
Ameiva ameiva 14, 285
Amia 840–841
calva 284
Amphibia 228, 618–623, 685–686
Amphioxus 415
Amphipoda 644–645
Amphiprion 77
Aphidiidae 644
Anabas 211
Anacanthobatis 560
Anampses 454
Anatolepis 918
Anchoa marini 843
Anilocra partita 937
Angelica pachycarpa 658
Anguidae 314
Anguilla rostrata 1, 544, 546
Anguis fragilis 658
Annelida 291
Anodontyla 789, 791–792
Anolis 81, 86, 285, 502–511
biporcatus 686
carolinensis 196, 503, 906–909
petersii 686
sagrei 502–511
Anomochilus 131
Anomopoda 635–645
Antennariidae 441, 453
Antennarius
hispidus 188
striatus 187–189
Anotheca spinosa 269
Antigonus sp. 451
Antillophis parvifrons 84, 91
Anura 228, 379–383, 685–686, 750–758
Apareiodon 337–348
affinis 340, 342
argenteus 337–348
cavalcante 337–348
davisi 340, 342
gransabana 340, 342, 344
hasemani 340, 342
ibitiensis 342, 346
itapicuruensis 340, 342
machrisi 337–348
piracicabae 340, 342, 344
tigrinus 337–348
vittatus 340, 342, 344
Aphareus rutilans 452
Aphoristia
gilesii 815
sp. 810–812
woodmasoni 810, 815–816
Aphredoderus sayanus 278, 284
Apistogramma steindachneri 258
Aplodinotus grunniens 284
Apocynaceae 266
Apogon
aurolineatus 611
binotatus 611
coccineus 451
deetsie 611
erythrinus 451, 611–612
kallopterus 438, 451, 611–612
lachneri 611
leptocaulus 611
maculatus 611
maculiferus 451, 611
menesemus 451
phenax 611
pillionatus 611
planifrons 611
pseudomaculatus 611
quadriscutatus 611
robbinsi 388
semilineatus 388
townsendi 611
Apogonichthys perditus 451, 612
Apogonidae 212, 389, 438, 441–442, 451, 608–617
Aposturisoma myriodon 570
Aprion virescens 452
Aranae 644
Araneae 291, 645
Arbutus unedo 866
Archocentrus
nigrofasciatus 801
spilurus 801
Arcoscopus japonicus 203
Argentina striata 844
Argentohyla siemersi 382
Ariomma bondi 423
Aristida beyrichiana 846
Arizona elegans 311
Armeria pubigera 658
Arnoglossus 833–834
annulatus 834
intermedius 833–834
Arothron
hispidus 453, 459, 463
meleagris 439, 440, 459, 463
Artemia
franciscana 156
sp. 59
Artemisia tridentata wyomingensis 191
Asaphus truei 402
Askoldia 803–804
Aspidoras 347
Aspidosperma absurinervea 266
Astatheros longimanus 801
Astropteryx semipunctatus 439
Asterorhombus 833–837
cocosensis 833–837
intermedius 834
Astropteryx semipunctatus 440, 447
Astragalus
puncticulatus 611
stellatus 611
Astroblepidae 572
Astroblepus sp. 572
Astronotus ocellatus 201
Astyanax
altiparanae 592
fasciatus 592

Atelopus cruciger 686
Athene noctua 900
Atherinidae 155-159
Atheriniformes 594-600
Atherinopsidae 219, 594-600
Auchenipteridae 799
Aulostomidae 438, 441, 453, 458, 462
Aulostomus chinensis 438, 440, 444-445, 453, 458, 462, 472, 474
Aves 314
Baetidae 586
Bagridae 373-378
Bagrus
flavus 686
keletius 377
micracanthus 377
nemurus 686
planiceps 686
sieboldii 686
Balistidae 439, 441-443, 453, 458, 462
Balistoides 213
conspicillum 213
Batrachia 205
Batrachochytrium dendrobatidis 160, 601-607
Bedotiidae 219
Blanus cinereus 131
Blattaria 13, 15, 17, 291
Blenniidae 441
Blenniidiae 212, 454
Boa constrictor 84, 91
Bodianus bilunulatus 438, 440, 447, 454
Boidae 82, 91
Bombina 41
bombyna 41
variegata 41
Boophis ankaratra 792
Bothidae 441, 453, 458, 462, 833-837
Bothriechis 862
schlegelii 206, 937
Bothrops 778
alternatus 778
insularis 84, 92
jararaca 778
Bothus
(Arnoglossus) 834
cocosensis 834
mancus 453
pantherinus 453, 458, 462
Brachydanio 714-728
reno 32
Bramidae 422
Brevortia tyrannus 550
Briza media 658
Bryconamericus sp. 799
Bufo 40, 350, 353-354
americanus 34-43
boreas 160-165
bufo 354
calamita 160, 349-356
fowleri 34-43
hemiophrys 34
japonicus 160
marinus 17, 160
microscaphus 40
terrestris 34
woodhousii 40
Bungarus 424
multicinctus 424
Buteo
buteo 900
jamaicensis 392, 394
lineatus 394
Byrsomima 29
Caiman
crocodilus
c. crocodilus 628
c. yacare 628-634
Callichthys callichthys 592
Calliella 789
Calluna vulgaris 866
Calotomus carolinus 454
Cantherhines
dumerili 453
sandwichiensis 453
verecundus 453
Canthidermis maculatus 439, 453
Canthigaster
coronata 453
jactator 453
Caproidae 441-442, 445, 451
Caquetaia 801
kraussi 801
myersi 801
umbrifera 801
Caracanthidae 68-80, 441-442, 445, 451
Caracanthus 68-80
maculatus 69
sp. 451
typicus 68-80, 451
unipinna 68-80
Carangidae 212, 441, 453
Carangoides orthogrammus 453
Caranx
ignobilis 453
melanopygus 453
Carassius auratus 440, 856
Carcharhinus
amblyrhynchos 451
leucas 315
plumbeus 451
Carettochelys insculpta 894-898
Carex sp. 327
Cariocaraceae 266
Casiomyzon 687-703
wagneri 689-690, 693, 696
Cathartes ustulatus 314
Calostomus
catostomus 759, 763
commersoni 765
micros 681
occidentalis 680-681
sp. 759-768
Caudata 149-154, 887
Cemophora coccinea 393
Centropyge
flavissimus 452, 459, 463

loricula 459, 463
loriculus 453
potteri 453, 459, 463, 475

Cephalopholis
argus 452

Cerastes 131–137
cerastes 131–137
vipera 131–137

Ceratichthys micropogon 228, 685

Ceratopogonidae 644–645

Cetopsidae 258

Chalcides
bedriagai 658
striatus 658

Chaenopsidae 241–247

Chaetodon
auriga 452, 458, 462
citrinellus 452
ephippium 452, 458, 462
fremblii 452
kleini 438
kleinii 452
lunula 452
miliaris 452
multicinctus 452
ocellatus 458, 462
ornatissimus 452, 458, 462
quadrimaculatus 452
tinkeri 452
trifascialis 452, 458, 462
unimaculatus 438, 452, 458, 462

Chaetodontidae 438, 441–442, 445, 452, 458, 462, 464

Chaetostoma sp. 573

Cheilio inermis 454

Chela 714–728
laubuca 723
 sp. 716–717, 722–723, 725–728

Channa 211

Chanos 175–180
chanos 175–180, 843

Characidae 258, 583–587, 799

Characidium
sp. 799
zebra 592

Characiformes 583–587, 686, 922, 936

Charina bottae 311

Cheirodon axelrodi 674

Chelonia mydas 896

Chelydra serpentina 331, 896

Chilopoda 291

Chiromantis kachowskii 228, 685

Chironomidae 635–645

Chironomus 619
 sp. 880

Chlorurus
perspicillatus 454
sordidus 454, 457, 459, 463, 476

Chondrichthyes 553–561, 919

Chromis
agilis 451
hanui 437–438, 445, 451
ovalis 438, 444–445, 451, 457, 459, 463–464
punctipinnis 451
vanderbilti 438, 451, 459, 463

verater 438, 444–445, 451

Chromys oblonga 794

Chrysemys
picta 326–327, 331–334, 366–372
p. bellii 332–333
p. marginata 326–336

Chylopoda 644

Cicadellidae 644

Cichlasoma 794, 799–800
amazonarum 801
atromaculatum 800–801
bimaculatum 801
dimerus 801
facetum 794–802
octofasciatum 801
ornatum 801
ramsdeni 801
scitulum 794–802
tembe 794, 800–801
urophthalmum 801

Cichlidae 181–186, 258, 824–832

Circaetus gallicus 900

Circus cyaneus 394

Cirrhitidae 441, 453, 458, 462

Cirrhitops fasciatus 453, 458, 462

Cirrhitus pinnulatus 453

Cirrripedes vanderbilti 454

Cistus salviifolius 658

Cladocera 638–639

Cleithracara maronii 801

Clelia clelia 84, 91

Clepticus parrai 124

Clinocottus
analis 397–401
globiceps 397–401

Clupeidae 441, 452, 840–841

Clupeiformes 922

Clupeoidei 839

Clupeomorpha 679, 843

Cnemidophorus 197–198, 285–298, 314
cryptus 285–298
gramivagus 285–298
lacertoides 285
lemniscatus 14, 285–298
litoralis 285
nativo 285
ocellifer 285–298
parcisi 285–298
tigris 197, 286, 309, 314, 771
vacariensis 285
velox 771

Cnidaria 644

Coenigriion resolutum 58–59

Coenigriionidae 58

Coleonyx variegatus 937

Coleoptera 13, 15, 291, 644–645

Collembola 635–645

Coluber
constrictor 393
viridiflavus 201

Colubridae 81–94

Conger
cineratus 53
myriaster 550

oceanicus 544-552
oligoporous 451
Congridae 441, 451
Copella nigrofasciatus 258
Copepoda 644-645
Cophyla 789, 791
Cophylinae 789
Corallizetus cardonae 98
Corallus hortulanus 84, 91
Coregonus 739-749, 840-841
 alpenae 739
 artedi 739-749
 athabascae 746
 bartletti 739
entomophagus 746
hoysi 739
hubbsi 739
johannae 739
kiyi 739, 746
(Leucichthys) 739
macrognathus 746
nigripinnis 739
n. regalis 746
nipigon 739-749
reighardi 739
zenithicus 739-749
Coris 129
flavovittata 454
gaimard 457, 459, 463
venusta 454, 459, 463
Cornus florida 532
Coronella
 austriaca 900
girondica 658
Corvus ossifragous 733
Corydoras aeneus 592
Coryphaena hippurus 454
Coryphaenidae 441-442, 445, 454
Cottidae 624-627
Cottinae 624
Cottus 624-626
aleuticus 625-626
aleuticus 624
asper 624-626
bairdii 624-626
beldingi 624-625
beldingii 626
caeruleomentum 624-626
carolinae 624-626
cf. hypselurus 624-627
cognatus 624-626
hypselurus 624-627
perplexus 624-626
rhotheus 624-626
ricei 746
Creagrutus 583-587
amoenus 583-587
kunturus 583-587
tuyuka 583-584, 586
Crenicichla
lepidota 799
scottii 799
Crenuchidae 258
Crenuchus spilurus 258
Crinia georgiana 248-254
Crocodylus 877
niloticus 628
novaeguineae 628
palustris 628
porosus 385, 628
Crossodactylus 166, 173
Crossostoma lacustre 32
Crotalus 667
atrox 393, 778
catalinensis 84, 92
durissus 84, 92
d. durissus 778
d. terrificus 778-779
enyo 84, 92
exsul 84, 92
horridus 235, 238
mitchelli 84, 87, 92
m. pyrrhus 778
molossus 84, 92
m. molossus 778
oreganus 190, 192, 311, 393, 770, 775, 777
o. concolor 190-194, 769-782
o. helleri 769-782
o. oreganus 769-782
organus abyssus 192
ruber 84, 92, 778
scutulatus 779
tigris 779
tortugensis 84, 93
viridis 84, 93, 190, 192, 769-770
v. viridis 190, 192, 778
Crotaphytus
collaris 488
vestigium 686
Croton urucurana 592
Cruriraja 560
Crustacea 291
Cryptacanthodes giganteus 203
Ctenochaetus strigosus 439, 440, 453, 458, 462
Clenontus 206
Clenophorus ornatus 481
Cubiceps 423
Culicidae 644
Curculionidae 644
Curimatidae 799
Cyclothona 422
Cymolutes lectuse 454
Cynodon 686
gibbus 686
Cynoglossidae 810-817
Cynoglossus 921
Cyperaceae 592
Cyphotilapia 824-832
frontosa 824-832
gibberosa 824-829, 831
Cyprinella
camura 851-857
lutrensis 284
proserpina 787
venusta 279, 284, 851-857
Cyprinidae 1-12, 228, 493-501, 636, 714-728, 842, 851, 856
Cypriniformes 228, 685

Cyprinodon 912-913
navadensis 322
variegatus 322
Cyprinodontidae 322
Cyprinodontiformes 258, 783-788, 922
Cyprinus 715, 720
Cystisus
scoparius 900
sp. 866

Dactylis glomerata 658
Dactyloa biporcata 686
Dactyloptena
gilberti 214
macracantha 214
orientalis 214, 452
papilio 214
tiltoni 214
Dactylopteridae 214, 441, 452
Danio 200, 714-728
aequipinnatus 720
aff. *dangila* 716-718, 722, 728
albolineatus 714-728
chrysotaenius 721
dangila 714-728
devario 721-723
erythromicron 714-728
frankei 720
interruptus 721, 726
kakhienensis 721, 726
kyathit 723
maetaengensis 721-722
malabaricus 721, 726
nigrofasciatus 714-728
pathirana 720
pulcher 720
reio 714-728, 844
tweediei 720
Danio 728
Danionella translucida 714-728
Daniops 728
Daphne gnidium 409
Dascyllus 69, 464
albissella 438, 443, 445-447, 451
Dasyatidae 458, 462
Dasyatis
sabina 215-325
sayi 315
Delturus 570
Dendrobates 268
cf. *quinquevittatus* 268
Dendrobatidae 166-174
Dendrochirus 78
barberi 451
brachypterus 77-78
Dentatherinidae 219
Denticeps dupeoides 843
Desmognathus
conanti 533
monticola 533
Devario 714-728
apogon 714-728
chrysotaenius 714-728
devario 714-728

interruptus 714-728
kakhienensis 714-728
maetaengensis 714-728
malabaricus 714-728
Dialipina 920
Dicamptodon 402
aterrimus 605
tenebrosus 402-407, 531
Dicamptodontidae 531
Dinodon 424
rufozonatus 84, 91
Dionda diaboli 787
Diploglossus
bilobatus 207
Diplopoda 13, 15, 291
Dipsadoboae underwoodi 418
Dipsas variegata 84, 91
Diptera 13, 15, 291, 644-645, 880
Dipturus laevis 933
Dorosoma 176-177, 179
cepedianum 176, 841
Dothideales 646
Duellmanohyla 206
Dyscophinae 789

Echidna catenata 47
Eigenmannia virescens 592
Eisenia foetida 706
Elanus leucurus 394
Elaphe
climacophora 84, 91
quadrivirgata 84, 91
quatuorlineata 84, 91
slowinskii 426
Elapidae 82, 92
Elassoma zonatum 284
Eleocharis sp. 592
Eleotridae 212
Eleutherodactylus 207
johnstonei 937
punctariolus 937
Elgaria
gilberti 309
multicarinata 309, 314, 394
sp. 314
Elopidae 212
Elopomorpha 843
Elops 841
sp. 843
Emblemaria 95-98
atlantica 96-97
australis 95-98
biocellata 96-97
caldwelli 98
caycedoi 97-98
culmenensis 96-97
(Emblemaria) 98
hyltoni 95-98
hypacanthus
pandionis 95-98
piratula 97
(Psenoblemnus) 98
sp. 95
Emblemariaopsis 245

pricei 245
signifera 98
Empidonax oberholseri 309, 311, 314
Emydoidea blandingii 331
Emydura macquarii 896
Emys orbicularis 349–356
Engyprosopon 833–837
coccosensis 833–837
fijiensis 833–834
mozambiquensis 834–836
natalensis 836
sp. 834
xenandrus 833–834
Ennallagma cyathigerum 58–60
Entomophenus 687–703
macrostomus 689–690, 692, 696, 701–702
minimus 689, 696, 701–702
simulus 689–690, 692, 696, 701–702
tridentatus 689–690, 692, 696, 701–703
Eopsetta jordani 204
Ephemeroptera 586, 644–645
Epilulus insidiator 454
Epinephelus quernus 452
Erica sp. 866
Erimyzon
oblongus 274, 284
sucetta 284
Erythrinidae 258
Erythrinus erythrinus 258
Erythrolamprus mimus 207
Erythrolamprus bizona 207
Eschweilera cf. *odora* 266
Esocidae 840, 844
Esomus 714–728
barbatus 724
sp. 722–728
Esox 679, 840–841
americanus 274, 284
lucius 204
masquinongy 844
Esselenichthys 414
Etelis carbunculus 452
Etheostoma 512–530
baileyi 578
barbouri 513, 516, 518–522, 527–528, 530
barrenense 578
basilare 517–528, 530
bellator 578
(Boleosoma) 139
brevirostrum 578
caeruleum 138–148, 926
(Catonotus) 138, 144, 512–530
chermocki 578
chlorosomum 284
colorosum 578
coosae 578
cragini 1, 144
cervus 576–582
derivativum 517–528, 530
duryi 578
etnieri 578
flabellare 138, 514, 516, 518–519, 530
flavum 578
gracile 278, 284
grahami 787
kennicotti 514, 516, 518–521, 530
lachneri 578
lepidum 144
neopterum 138
nigrum 139
obeyense 512–513, 516, 518–522, 527–528, 530
(Oligocephalus) 139, 144
oophylax 138, 514, 518–522, 530
parvipinne 274, 284
percurvum 514, 516, 518–521, 530
pseudovulatum 138–139
pyrrhogaster 576–582
rafinesquei 578
ramseyi 578
raneyi 420, 578
rubrum 420
scotti 578
simoterum 578
smithi 512–513, 516, 518–522, 527–528, 530
spectabile 144
squamiceps 139, 514, 518–521, 530
striatum 513, 516, 518–522, 527–528, 530
(Ulocentra) 576–582
virgatum 139, 512–530
Eucalyptus 391–396
globulus 658
Eudontomyzon 687–703
danfordi 689–690, 692, 696, 701–702
morii 689–690, 692, 696, 701–702
Eumeces 310, 311
gilberti 314
skiltonianus 314
sp. 314
Euproctis 149, 152
asper 149, 152
montanus 149, 152–153
platicephalus 149
platycephalus 149–154
Eurycea
bislineata 531, 540
b. cirrigera 531–543
guttolineata 533, 711
wilderae 531
Euthynnus affinis 452
Exallias brevis 454
Falco tinnunculus 658, 900
Felis catus 394, 658
Fistularia commersonii 453, 459, 462
Fistulariidae 441, 453, 459, 462
Foa brachygramma 451, 611–612
Forcipiger flavissimus 438, 452, 458, 462
Formicidae 13, 15, 17, 291, 639, 642, 644–645
Fugu rubripes 32
Fundulus 912
chrysotus 284
notatus 281, 284
Furcodontichthys novaesi 570

Gambusia 783-788
affinis 278, 284, 783, 787
amistadensis 783
clarkhubbsi 783-788
eurystoma 784
gaigei 783
geiseri 783, 787
georgei 783, 787
heterochir 783, 785
krumholzi 784-785
nobilis 783-788
senalis 783, 787
sexradiata 784
speciosa 783, 787

Gammarus duebeni 158

Garra 921

Garrulus glandarius 900

Gasterosteus aculeatus 760

Gastropoda 291, 644

Geotria 687-703
australis 688-690, 692-693, 695-696

Geotriidae 687, 693

Gnathanodon speciosus 453

Gobiidae 212 438, 441, 452

Gobiodon 68-69, 77

Gobiosoma 69

Gomphosus varius 454, 459, 463

Gonorynchiformes 175-180, 838-845

Gopherus polyphemus 846-850

Graminae 592

Grammidae 609

Grammistidae 609

Graptemys 729, 734
barbouri 734
ernsti 734
flavimaculata 729-738
geographica 729, 734
nigricauda 734
oculifera 729, 736
ouachitensis 729, 734
pseudogeographica 729, 734

Guzmania 266

Gymnodactylus geckoides 294

Gymnogeophagus sp. 799

Gymnophthalmus 198
underwoodi 418

Gymnothorax
eurostus 452
flavimarginatus 452
funebris 47
moringa 44-55
nuttingi 452
sp. 544
undulatus 452
vicinus 44-55
ypsilon 452

Gymnotiformes 258, 347, 922

Gymnotus
carapo 260
cf. stenoleucus 258, 260
cf. sylvius 592

Haemulon aurolineatum 129

Halichoeres

bimaculatus 124
bivittatus 49, 51
ornatissimus 454, 459, 463
pictus 124-130
socialis 124-130
zebrinus 124

Hardistiella montanensis 688-689

Helicolenus 78

Helogenes marmoratus 258-259

Hemibagrus 686

Hemidactylum scutatum 534

Hemidactylus garnotii 937

Hemigrammus 259, 261
sp. 258-260

Hemilepidotus zapus 204

Hemipsilichthys
gobio 569-570

Hemiptera 13, 15, 17, 291, 644

Hemiramphidae 441, 451

Hemitaenrichthys
polyolepis 452
thompsoni 452

Hemitriptoridae 422

Heniochus diphyreutes 452

Heptapteridae 258

Herichthys minckleyi 801

Herklotisichthys quadrimaculatus 452

Heroina 800-801
isonycterina 801

Heros 801
acaroides 794, 800
autochton 794, 801, 800
facetus 799
jenynsii 794, 796, 800
sp. 801-802

Heterodon 131
platirhinos 393

Heteropriacanthus cruentatus 433-454

Heterotis 840

Hiobius 843

Hippoglossoides elassodon 204

Hisonotus 588-593
insperatus 588-593
nigricauda 592-593
notatus 592-593

Histrio histrio 453

Holacanthus
arcuatus 453
bermudensis 228, 685
ciliaris 685
c. bermudensis 228, 685

Holocentridae 49, 51, 438, 441, 451, 459, 462

Holocentrus
ascensionis 50
sp. 50

Homeothermia 919

Homoptera 291, 644

Hoplarchus 801
psittacus 802

Hoplias
malabaricus 260
microlepis 260
sp. 258, 260
tararira 799

Hyalinobatrachium valerioi 206
Hybognathus 1-12
argyritis 2, 12
evansi 7
hankinsoni 1-12
nubilum 7
n. evansi 7
n. placitus 7
nuchalis 2, 7, 12, 854
n. placita 7
placitus 1-12
placita placita 7
stramineus 228, 685
Hydropsychidae 586
Hygrophila sp. 592
Hyla 206, 353-354
adenoderma 382
arenicolor 601
meridionalis 349-356
regilla 646, 648
venulosa 379
Hylarana albomaculata
Hylidae 171, 263-272, 379-383, 750-758
Hylodes 166, 173
nasus 166
Hylodinae 166-174
Hymenochirus 885
boettgeri 879
Hymenoptera 13, 15, 291, 644-645
Hypentelium nigricans 765
Hypessobrycon 256, 260
cf. heterorhabdus 257-259
cf. melazonatus 257-260
Hypoplectrus 609
Hypopomidae 258
Hyporhamphus acutus 451
Hypostomus
ancistroides 592
sp. 573
Hypotopomatinae 588
Hypselecaria 800-801
temporalis 802
Hypsilema torquata 311
Hypsophrys nicaraguensis 802
Icelinus burchami 822
Ichthyomyzon 687-703
bdeum 689-690, 696, 700
castaneus 689-690, 692, 697, 700, 702
gagei 284
gageo 278
unicuspis 689-691, 697, 700-702
Ichthyosaura 228
Ichthyosaurus cornalianus 228
Ictaluridae 20-33
Ictalurus punctatus 21-24, 26-27, 31, 33, 284, 844
Iguanodectes variatus 258-259
Imantodes cenchroides 207
Imparfinis mirini 592
Inlecypris 714-728
auropurpurea 716-717, 722-723, 725-728
Isopoda 291
Isoptera 291
Istiblennius zebra 454
Istiophoridae 441, 454
Juniperus communis 900
Kasatkia 803
memorabilis
seigeli 807, 809
Katsuwonus pelamis 452
Kentropyx 198
strata 14
Kinosternon subrubrum 896
Kneria auriculata 843
Kuhlia sandvicensis 437-438, 451
Kuhliidae 438, 441-442, 451
Kurtidae 384-390
Kurtoidei 384
Kurtus 389
gulliveri 384-390
indicus 384
Kyphosidae 441, 453
Kyphosus bigibbus 453
Labridae 49, 51, 54, 212, 438, 441-442, 454, 459, 463-464, 937
Labroides phthirophagus 454, 459, 463
Lacerta
aranica 202
aurelio 202
bilineata 202
bonnali 202
leptidea 658
virdis 202
vivipara 201
Lachesis stenophrys 206
Lagodon rhomboides 322
Lamna ditropis 203
Lampetra 687-703
appendix 680
ayresii 688-690, 692, 694-695, 697, 702
fluvialis 688-690, 692-695, 697, 701-703
lethophaga 681
richardsoni 760
similis 680
Lampropeltis 312
alterna 308-314
getula 308-314, 733
g. californiae 311
herrerae 308
pyromelana 308-314
triangulum 207
zonata 308-314
z. herrerae 308
Lanius excubitor 900
Latimeriidae 212
Lavandula 409, 412
stoechas 409
Lebiasinidae 258
Lecythidaceae 266
Leiopelta hochstetteri 171
Leiopelmatidae 171
Leiopropoma 609
Lepidochelys olivacea 896
Lepidoptera 13, 15, 17, 291
Lepismatidae 644

Lepisosteus 841
Lepomis 679
cyanellus 278, 284, 646
gulosus 284
macrochirus 284
marginatus 284
megalocephalus 278, 284
microlophus 284
punctatus 284
Leporinus sp. 799
Leptocottus armatus 624–626
Leptodactylus
macrosternum 17
ocellatus 17
Leptodeira septentrionalis 207, 646
Lethenteron 687–703
camtschaticum 689–690, 692, 697
Lethotremus muticus 204
Lethrinidae 219
Leucichthys 746
artedi 746
bartletti 746
hubbsi 746
nigripinnis 746
Leucoraja erinacea 553–561
Leuresthes 594
sardina 594
tenuis 594–600
Limnephilidae 58
Limnephilus sp. 58–59
Lindera benzoin 532
Linophrynididae 212
Liopeltis 667
vernalis 667
Liparidae 818–823
Liparis 818, 820
adiastolus 818–823
aleuticus 822
callyodon 821
chefuensis 823
curicensis 819–822
fabricii 823
florae 819–821
gibbus 823
kussakini 822
miostomus 820–821
rutieri 818–823
r. kussakini 820, 822
tunicatus 823
Liquidambar styraciflua 532
Liriodendron tulipifera 532
Lithogeninae 562–575
Lithogenes 563, 568–570
valencia 562–575
villosus 562–575
Litoria
ewingii 750–758
verreauxii 750–758
v. alpina 750–758
v. verreauxii 750–758
Loricariidae 562–575, 588–593, 799
Lota lota 204
Lumpenopsis 803–809
clitella 803–809
hypochromis 803–809
pavlenkoi 803–809
tricellata 803–809
Lutjanidae 441, 452
Lutjanus 213–214
deccussatus 213
kasmira 213, 452
quinquelineatus 213
Lythrurus
funeus 278, 284
roseipinnis 635–645
umbratilis 279, 284
Lythrypnus 77
Macropygia
aestivalis 493–501
a. tetraneurus 1
australis 493–501
gelida 494–496, 499
hyostoma 493–501
marconis 493–501
storeriana 852–854
tetranema 1, 493–501
Macrones 373
Macrobrachium geoffroy 454
Madecassophryne 789, 791
Majidae 54
Makaira mazara 454
Malaclemys terrapin 366, 896
Malapteruridae 32
Malapterurus sp. 32
Mammalia 314
Manta birostris 202
Mantodea 291
Masticophis
bilineatus 84, 91
lateralis 311
Mauremys leprosa 349–356
Mauritia flexuosa 266, 268
Mayomyzon piechoensis 688–689
Megaelosia 166–174
boticariana 166–174
lutzae 166–174
massarti 166–174
Megalania 877
Megalops cyprinoides 843
Melanotaenidae 219
Meliaceae 266
Melichthys
niger 453
vidua 453
Menidia 157–158, 212
beryllina 281, 284
menidia 155, 157–158, 446
peninsulae 155–159
Mesaspis monticola 207
Mesonautia 801
acora 802
egregius 802
insignia 802
Metriacanthidae
barlowi 182, 184–185
benetos 182, 184–185
zebra 182, 184–185

Microglanis sp. 258, 592
Microlepidogaster 588
depressinotus 593
Micropterus
punctulatus 284
salmoides 275, 284
Microrasbora 719
rubescens 714–728
Micromus 394, 775
californicus 394
Micrurus
fulvius 393
nigrocinctus 206
Millipora 47
Mimosaceae 266
Minytrema melanops 278, 284
Mithrax sculptus 49, 51, 54
Mixosaurus 228
cornalianus 228
Mochokidae 32
Moenkhausia 347
sp. 258
Molidae 219
Monacanthidae 453, 459, 463
Monocanthidae 439, 441–442
Monopterus 211
Montastrea annularis 47
Moraceae 266
Mordacia 687–703
lapicida 689–690, 695, 697, 701–702
mordax 689–691, 695, 697, 701–703
Mordaciidae 687, 693
Moridae 441, 452
Moxostoma poecilurum 284
Mugil cephalus 452
Mugilidae 212, 441, 452
Mullidae 438, 441–442, 451, 459, 463
Mullloidichthys
flavolineatus 438, 451
vanicolensis 451, 459, 463
Muraena milialis 47
Muraenidae 49, 51, 441, 452
Muridae 314, 771
Mustela vison 766
Myoxocephalus thompsoni 746
Myripristis
amaena 451
berndti 438, 440, 451
vittata 451
Myrophis punctatus 544
Mysis oculata 746
Mystus 373
bimaculatus 376
castaneus 373
imphuviatus 373–378
nigriceps 373
Myxinidae 219
Naididae 644
Nandopsis tetricanthus 802
Nannostomus marginatus 258–259
Naso
caesi 453
hexacanthus 453
lituratus 439, 453, 458, 460, 462
unicornis 439, 453, 458, 462
Natrix 667
maura 658
natrix 84, 91, 202, 417
Nematabramis 722
Nematoda 644–645
Nemuroglanis pauciradiatus 257–258
Neoceratodus 920
Neolinus blanchardi 388
Neoliparis aleuticus 822
Neoniphon sammara 437–438, 446, 451
Neoplectostomus 569
micros 570
Neopterygii 920
Nerodia
rhombifer 233
sipedon 84, 91, 711
Neuroptera 291
Nocomis micropogon 228, 685
Norops 206
Notechis ater 84, 87, 92
Notemigonus crysoleucas 278, 284, 854
Notocheiridae 219
Nototriton 207
Notropis
atherinoides 854
atrocaudalis 279, 284
blennius 852–854
longirostris 851–857
ludibundus 228
maculatus 851–857
rufinesquei 420
stramineus 228, 685
texanus 851–857
topeka 1, 851, 854–855
volucellus 284
wickliffei 851–857
Noturus 20
gyrinus 284
nocturnus 278, 284
Nuphar variegatum 327
Nuria albolineata 714
Octopus sp. 49
Odatria keithhornei 228
Odonata 13, 15, 291
Oligochaeta 635–645
Omobranchus rotundiceps 454
Oncorhynchus
clarki 402–407, 760
c. clarki 402
kisutch 760
mykiss 32, 322
Ophichthus gomesi 544
Ophidiidae 441–442, 445, 451
Opisthocentrinae 803
Opisthothecus 803–804
ocellatus 807
Opsariichthys pachycephalus 842, 844
Opsopoeodus emiliae 284
Oreortyx pictus 311
Orbittidae 644
Ornithopoda 877

Orthoptera 13, 15, 291, 638, 644–645
Osmerus mordax 840–841
Ostariophysi 175–180, 588–593, 679, 843
Osteichthyes 54, 228, 685–686
Osteocephalus
 langsdorffii 382
 oophagus 268–269
 sutilis 382
Osteoglossomorpha 843
Osteoglossum sp. 843
Osteopilus brunneus 269
Ostraciidae 439, 441, 453, 459, 463
Ostracion 187
 knorrii 187–189
 meleagris 439–440, 453, 459, 463
Otocinclus 588
 depressicauda 593
 francirochai 593
 paulinus 592
Oxycheilinus unifasciatus 454
Oxycirrhites typus 453

Pachycara 357–365
 andersoni 357–364
 arabica 358–364
 brachycephalum 359, 364
 bulbiceps 359, 364
 cf. obesus 357
 crassiceps 359, 364
 crossacanthum 359, 362, 364
 garricki 359
 goni 359, 363
 gymninium 359, 364
 lepinium 359, 364
 mesoporum 359
 microcephalum 359, 364
 nazca 359, 363, 364
 obesus 364
 pammelas 359
 rimae 359, 364
 shcherbachevi 357–365
 sp. 357
 sulaki 359
 suspectum 359
 termophilum 359
Panulirus argus 49, 51
Parabarilius 714, 723
Paracheirodon
 axelrodi 672
 innesi 674
Parachromis 801
 dovii 802
 friedrichsthalii 802
 managuensis 802
Paracirrhites
 arcatus 453
 forsteri 453
Paragobiodon 69, 77
Parapercis schauinslandii 454
Paraplotosus 213
Parasitiformes 644
Parodon 337
 piracicabae 337
Parupeneus

bifasciatus 451
cyclostomus 451, 459, 463
multifasciatus 438
multifasciatus 446, 451, 459, 463–464
porphyreus 451
Pedioplanis undata 685
Pellona 839
 flavipinnis 840–841, 843
 harroweri 839–840, 842–843
Pelmatochromis frontosus 824, 830
Pelobates 353–354
 cultripes 349–356
Pelobatidae 171
Peltoccephalus dumerilianus 673
Percidae 138, 512–530, 576–582
Perciformes 258, 384–390, 644–645, 685, 824–832, 922, 937
Percina sciara 278, 284
Percoidae 389
Peromyscus 772, 775
 maniculatus 309, 314, 771
 sp. 314
Pervagor
 aspriocaudus 437, 439–440, 453, 459, 463
 spilosome 439, 453, 459, 463
Petenia 801
 splendida 802
Petromyzon 687–703
 marinus 689–690, 693–694, 697
Petromyzontidae 687, 693, 700–703
Petromyzontiformes 687–703
Phaeoptyx
 conklini 611
 pigmentaria 611
 xenus 611
Phagocotus gracilis 646
Phalaris sp. 760
Phalloceros
 caudimaculatus 592
 sp. 799
Phallostethidae 219
Phasmidae 291
Phaenosphaeriaceae 646
Philodryas viridissimus 268
Phlaeothripidae 639, 642, 644–645
Phrynidium crucigerum 686
Phrynohyas 268, 379
 coriacea 379–380, 382
 imitatrix 379–380, 382
 leptidea 379–382
 mesophaea 379–380, 382
 resinifictrix 263–272, 379–380, 382
 venulosa 379–380, 382
Phrynosoma modestum 862
Phrynosomatidae 314
Phyllodrytes luteolus 269
Piabina argentea 592
Piaractus brachypomus 323
Pica pica 900
Pimelodella sp. 592
Pimelodidae 799
Pimephales
 notatus 852–854
 vigilax 278, 284

Pinguipedidae 441, 454
Pinus
palustris 846
pinaster 658
sp. 866
sylvestris 900
taeda 274, 532
Pipa 879, 885
Pipidae 885
Pipilo chlorurus 311
Pipiscius zangerli 688–699
Pisces 155–159, 588–593
Pitho anisodon 49, 51
Pituophis 131
catenifer 84, 92, 391–396
melanoleucus 393–394
Platophrys
(Arnoglossus) 833–834
cocosensis 833–834
intermedius 834
Platycephalidae 78
Platypelis 789, 791–792
Plecoptera 644–645
Plectranthias 213
Plectrobranchus 803–804, 808
evides 809
Plectrochilus 419
Plectroglyphidodon
imparipennis 451
johnstonianus 438, 451
Plectrypops lima 451
Plethodon 403–404, 666, 668
cinereus 605, 862
dunni 403
glutinosus 534
vehiculum 403
Plethodontidae 531, 533–534
Plethodontohyla 789–793
coronata 789–793
inguinalis 791
minuta 791
notosticta
serratopalpebrosa 789–793
Pleuronectiformes 810–817, 833–837
Plotosidae 213
Plotosus 213
lineatus 213
Pocillopora meandrina 69–70
Podarcis 657–658, 662
atrrata 202, 657, 662
bocagei 658
b. berlengensis 657
carbonelli 202
c. berlengensis 657
hispanica 202, 657–665
lilfordi 657, 663
milensis 663
muralis 899–905
pytusensis 657
Podocnemis erythrocephala 673
Podocopida 644–645
Poecilia 200
Poeciliichthys virgatus 521
Poeciliidae 299–307, 783–788, 799
Poeciliopsis 913
Poecilopora 69
Pogonichthys macrolepidotus 851, 854
Polybia rejecta 646
Polychrotidae 906–909
Polydactylus sexfiliis 451
Polyipnus 422
Polynemidae 441, 451
Polypterus 840
Polystichium acrostichoides 532
Pomacanthidae 228, 441–442, 452–453, 459, 463
Pomacanthridae 212, 438, 441–442, 445, 447, 451, 459, 463
Pomoxis annularis 284
Pontoporeia affinis 746
Pontinus macrocephalus 452
Porichthys notatus 936
Porites 69
Portunus sp. 49, 51
Potamogeton sp. 327
Priacanthidae 441–443, 452
Priacanthus
arenatus 452
meeki 452
Prietella 20
Priolepis sp. 452
Pristigasteridae 842
Pristigasteroidea 839
Pristipomoides
filamentosus 452
sieboldii 452
zonatus 452
Procambarus nigrocinctus 646–649
Proceratophrys boiei 937
Prochilodus lineatus 799
Procyon lotor 733
Prosopium williamsoni 936
Protacanthopterygii 679, 844
Psammodromus
algirus 408, 903
hispanicus 202
Pseudacris 65
triseriata 58, 65
Pseudamiaops gracilicauda 611–612
Pseudanthias
bicolor 452
squamipinnis 213
thompsoni 452
Pseudemys 733
concinna 896
Pseudhymenochirus 879, 885
Pseudocheilinus
octotaenia 454
tetrataenia 454, 459, 463
Pseudocoris 129
Pseudoescopiones 291
Pseudogramma polyacanthum 452
Pseudojuloides cerasinus 454
Pseudomugilidae 219
Pseudopimelodidae 258
Pseudotriton 668
ruber 534, 704–713
Pterois 78
Pterophyllum 801

scalare 802
Pterycombus brama 423
Pucapampella 919
Puntius 715, 720
Pylodictis 20
Pyrhulina brevis 258–261
Pythonodipsas 224

Quercus 409
ilex 409, 866
pyrenaica 658, 866
robur 866
suber 866

Raja
diaphanes 315
erinacea 315
laevis 315
ocellata 315
radiata 315
Rajidae 553–561
Ramallichthys 842
Ramibia barnia 728
Rana 50, 353–354
boylei 601–607
cascadae 646, 648
chiricahuensis 601
cryptotis 228, 685
perezi 349–356
pipiens 671
sphenoecephala 354, 646–649
sylvatica 654
temporaria 650–656
yavapaiensis 601–607
Ranidae 171, 228
Rasbora 715, 719
rasbora 716, 722–723, 725–726, 728
Rattus rattus 658
Regina septemvittata 711
Reithrodontomys megalotis 394, 771
Reptilia 205, 228, 314, 685–686, 771
Retama sphaerocarpa 409
Rhamdia
quelea 260, 592
sp. 260
Rhaphiodon 686
vulpinus 686
Rhinecanthus 213
aculeatus 213, 453, 458, 462
verrucosus 213
Rhinichthys cataractae 851
Rhinocheilus lecontei 84, 92, 311–312
Rhododendron nudiflorum 532
Rhomboophryne 789, 791
Rhombus cocomensis 833–837
Rhyacotriton variegatus 402, 531
Rhyacotritonidae 531
Rineloricaria sp. 799
Rivulidae 258
Rivulus 261
compressus 258–261
Rodentia 771
Saccodon 347

Salamandra
salamandra 605
s. salamandra 531
Salamandridae 149–154, 531, 618–623
Salmo 200
salar 844
trutta 323
Salmonidae 739–749
Salmonoidei 840
Sargocentron spiniferum 459, 462
Sargocentrum
diadema 451
punctatissimum 451
spiniferum 451
tiere 451
xantherythrum 438, 440, 451
Satan 20
Sauria 685–686, 906–909
Saurida
flamma 443, 451
gracilis 451
nebulosus 451
Sauromalus
ater 481–492
obesus 481–492
Scaphiophrynninae 789
Scaphirhynchus 683
albus 1, 683
platorynchus 683
Scapteriscus acletus 671
Scaridae 441–442, 454, 459, 463
Scarus
dubius 454
psittacus 459, 463
Sceloporus 310–311, 858, 862–863
graciosus 309, 314, 771
jarrovi *jarrovi* 858–861
merriami 121
occidentalis 109, 121, 309, 311, 314, 394
sp. 314
undulatus 100, 771
undulatus 99–123, 863, 917
u. consobrinus 858–864
u. erythrochelus 100, 103, 109, 120, 862
u. garmani 100, 109, 121
u. hyacinthinus 114
u. undulatus 100
u. undulatus 109
virgatus 110, 115, 119, 858–862
Sciaenidae 219
Sciaenops ocellatus 550
Scincidae 314, 937
Scirpus acutus 327
Sciuridae 771
Scomberoides lyisan 453
Scombridae 433–454
Scopelosaurus harryi 204
Scophthalmus aquosus 550
Scorpaenidae 78, 441, 451–452
Scorpaeniformes 68–80
Scorpaenodes kelloggi 452
Scorpaenopsis
brevifrons 452
cacopsis 452

Scorpiones 291
Sebastapistes coniorta 452
Sebastolobus 78
alascanus 78
macrochir 78
Selar crumenophthalmus 453
Selenanthias 213
Seriola dumerili 453
Serranidae 441, 452, 459, 463, 609
Serranus 609
Silurana 879
Siluriformes 20-33, 258, 347, 562-575, 686, 922
Simoselops 131
Simuliidae 644
Sistrurus 667
Smilisca 206
Smilodonichthys rastrosus 913
Solenopsis invicta 733
Solifuga 291
Sonora 667
Sorex
cinereus 775
palustris 309, 311
vagrans 775
Soricidae 314
Sphaeriidae 644
Sphaerodactylus underwoodi 418
Sphyraenidae 438, 441, 453
Sphyraena 214
barracuda 438, 446, 453
Sphyra lewini 452
Sphyraenidae 441, 452
Squalidae 441, 453
Squalus
acanthias 315, 933
mitsukurii 453
Squamata 228, 285-298, 314, 771, 937
Squatina californica 203
Steatogenys duidae 258
Stegastes
fuscilatus 438, 451
partitus 937
Stenorhynchus seticornis 49, 51
Sternarchorhynchus 347
Sternopygidae 258
Sternopygus
cf. astrabes 258
macrurus 592
Stethojulis lateata 454
Stichaeidae 803-809
Stizostedion 1
Storeria 666
dekeyi 666
Streptocalyx 266
Stumpffia 789-793
Stylophora 69
Sufflamen 213
bursa 439, 444-446, 453, 458, 462
Sundadanio 719
axelrodi 714-728
Sus scrofa 733
Syphurus 811, 815
arabicus 811
australis 815
bathysphilus 810-817
ligulatus 815
maldiveensis 815
marmoratus 815
nebulosus 815
ocellatus 815-816
sayademathensis 810, 815
strictus 815
variegatus 815
woodmasoni 810-811, 815-816
Syphynodon 801
discus 802
Sympterygia 560
Synbranchiformes 922
Synodontidae 438, 441, 451
Synodontis sp. 32
Synodus
ulae 451
variegatus 438, 451
Taeniura lymna 458, 462
Tamias 772
minimus 771
Tantilla coronata 393
Tenidae 285-298, 314, 771
Teleostei 1-12, 68-80, 138, 241-247, 373-378, 493-501, 583-587, 624-627, 714-728, 803-809, 818-823, 838-845, 936
Telmatobiidae 219
Tenebrio molitor 659
Terrapene 209
Tetraodontidae 439, 441-442, 453, 459, 463
Tetraleurodon 687-703
spadiceus 689-690, 697
Tetraptrurus
audax 454
angustirostris 454
Thalassia testudinum 44
Thalassoma
ballieui 454
bifasciatum 124
duperreyi 454, 459, 463
lutescens 459, 463
Thamnopis
elegans 710-711
sirtalis 84, 92
s. parietalis 236
sp. 311
Thomomys bottae 394
Thorichthys aureus 802
Thunnus albacares 452
Thymus 409, 412
mastichina 409
Tomopterna cryptotis 228, 685
Trachemys scripta 896
Trachycephalus
atlas 382
nigromaculatus 382
Trematomus sp. 323
Trichilia sp. 266
Trichomycteridae 419, 799
Trichoptera 586, 644, 646
Trimeresurus 877
flavoviridis 872, 877

okinavensis 872, 877
Trimma 69, 77
Triturus 152, 350, 354
 alpestris 618–623
 a. alpestris 619
 a. apuanus 619
 vulgaris 621–622
Trophus morii 831
Tropidurus semitaeniatus 295
Turdidae 314
Typha latifolia 327, 760
Tyrannidae 314

Uaru 801
 fernandezeyepi 802
Ulex
 europaeus 658
 sp. 866
Umbra limi 844
Underwoodisaurus 418
Uniola latifolia 532
Uromacer frenatus 84, 92
Uropeltidae 224
Urosaurus 858
 ornatus 110, 121, 481, 488, 858–861, 917
Uta
 palmeri 113
 stansburiana 771, 858–861

Vandellia 419
Vandelliinae 419
Varanidae 228
Varanus
 bengalensis 872–878

keithhornei 228
komodoensis 872
mertensi 895
panoptes 895
teriae 228
Veliidae 644–645
Vipera
 ammodyles 865, 870
 aspis 232, 865, 868–869
 berus 84, 93, 192 238, 865, 868–869
 latastei 865–871
 lebetina 84, 93
 seoanei 865, 869
 ursinii 865, 868
 xanthina 865, 870
Viperidae 81–94
Vulpes vulpes 394

Xantusia vigilis 937
Xenopus 879, 885
 laevis 605
Xiphophorus 300–301, 305
 birchmanni 299–307
 cortezi 299, 306
 malinche 299–307
 pygmaeus 299
Xyrichtys umbrilatus 454

Zanclidae 439, 441
Zanclus cornutus 439, 446, 453, 457, 459, 463
Zebrasoma
 flavescens 439, 440, 453, 458, 462, 474
 veliferum 439, 440
Zorotyidae 644

SUBJECT INDEX

COPEIA 2003, NOS. 1-4

ACTIVITY. *Gymnnothorax (moringa, vicinus)* (nocturn.) 44-55; *Catostomus* sp. (Salish Sucker) (activ. ptns. & other life hist. charcs., mngrnt. plan for endngrd. sp.) 759-768.

AGE. *Sceloporus undulatus* (male home range size rel. to age) 99-112; *Euprotus platycephalus* (popn. age struct., males longer-lived) 149-154; *Chrysemys picta marginata* (var. in matur. age) 326-336; *Vipera latastei* (& size at sex. matur.) 865-871; *Varanus bengalensis* (age assess. w/vertebral growth rings) 872-878.

BEHAVIOR. *Gymnnothorax (moringa, vicinus)* (beh. diff. btwn. spp.) 44-55; *Sceloporus undulatus* (male territ. & ctshp. beh., rel. to home range size, body size & color) 99-112; *Halichoeres socialis* n. sp. (unusual schooling beh. for genus) 124-130; *Cerastes (cerastes, vipera)* (mechanics of vertical burrowing) 131-137; *Etheostoma caeruleum* (female mate choice & male compet.) 138-148; *Metriacma (zebra, benetos, barlowi)* (female mate choice in spp. flock, cues are visual) 181-186; *Crotalus oreganus concolor* (mating beh. & mvmnts. shorter than in other popns.) 190-194; *Crinia georgiana* (energy consumpt. & other factors in indiv. var. in male calls) 248-254; *Xiphophorus (birchmanni, malinche, birchmanni × malinche)* (evol. of sexual signaling systems) 299-307; *Pituophis catenifer* (use of *Microtus* runways) 391-396; *Clinocottus (globiceps, analis)* (sp. diff. in beh. resp. to hypoxia) 397-401; *Dicamptodon tenebrosus*, *Oncorhynchus clarki* (chem. cues in salamander larv. def. against trout pred.) 402-407; *Acanthodactylus erythrurus* (resp. to repeated pred. attacks) 408-413; *Anolis sagrei* (prevention of dewlap extension not aff. male-male interact.) 502-511; *Leucoraja erinacea* (pushing off substrate & gliding, anal. of pelvic fin anat. & mvmnts.) 553-561; *Triturus alpestris* (no diff. in ctshp. btwn. paedomorphs & metamorphs) 618-623; *Caiman crocodilus jacare* (coord. terrest. group mvmts.) 628-634; *Petromyzontiformes* (the 18 parasitic spp.) (adult preferred microhab. rel. to evol. of retina) 687-703; *Litoria verreauxii* (large geogr. var. in calls, some rel. to sympathy w/ *L. ewingii*, some w/out sympathy) 750-758; *Gopherus polyphemus* (evid. for scramble compet. rather than harem defence polygyny) 846-850; Cyprinids (9 spp. in 4 gen.) (oral grasping to maintain position in flowing water) 851-857; *Vipera latastei* (leading to greater mortal. in adult males than females) 865-871; *Hymenochirus boettgeri* (beh. ptns. & kinematics of suction feeding in frog) 879-886; *Ambystoma maculatum* (gender diff. in swim & crawl speeds in breeding seas) 887-893; *Carettochelys insculpta* (grouping of nests not reduce pred. on individual nests, hypoths. of advntg. for grouping of nests) 894-898; *Podarcis muralis* (anti-pred. response depends on intens. of pred. & refuge temp.) 899-905.

BIOGEOGRAPHY. *Hybognathus (hankinsoni, placitus)* (taxon. charcs. identifying spp., clarifies histor. distrib. of endngrd. spp.) 1-12; *Boidae* (2 spp.), *Colubridae* (15 spp.), *Elapidae* (*Notechis ater*), *Viperidae* (12 spp.) (island effect on body size) 81-94; *Macropygia australis* sp. complex (*australis*, *tetranema*, *hyostoma*) (histor. biogeogr., rel. to intrsgres. hybrid.) 493-501; *Lithogenes (valencia* n. sp., *villoso*) (disjunct distrib. of subfam., biogeogr. hypoth.) 562-575; *Cottus (hypselurus*, sp. cf. *hypselurus*) (geogr. distant popns. closely related, intervening popns. less rel.) 624-627; *Coregonus (zenithicus, artedi, nippigon)* (histor. biogr. hypoth. for presence of 3 ciscos in inland lakes) 739-749.

BLOOD. *Sceloporus undulatus* (male plasma steroids rel. to soc. beh.) 99-112; *Crotalus oreganus concolor* (blood clotting abnormalities induced by venom) 769-782.

CALLS. *Crinia georgiana* (energy consumpt. & other factors in indiv. var. in male calls) 248-254; *Phrynohyas resinifex* (from treeholes in rainfor. canopy) 263-272; *Litoria verreauxii* (large geogr. var. in calls, some rel. to sympathy w/ *L. ewingii*, some w/out sympathy) 750-758; *Plethodontohyla coronata* n. sp. (recordings, times of calling) 789-793.

CANNIBALISM. *Ambystoma tigrinum nebulosum* (macroinvert. prey cues cannib. in larval salamanders) 56-67; *Phrynohyas resinifex* (eggs eaten by conspec. larvae in treeholes) 263-272.

CHEMORECEPTION. *Rana sphenocephala* (hitchng. accel. in presence of crayfish pred., even with no pred.-egg contact) 646-649.

CHROMOSOMES. *Megaelosia (massarti, botiaciana, lutzae)* (karyo. var. btwn. spp., btwn. genera & w/ in *M. massarti*) 166-174.

COLONIZATION. stream fishes (41 spp.) (eff. of dams on upstream recolonization) 273-284.

COLORATION. *Sceloporus undulatus* (male color. rel. to territ. & ctshp. beh., home range) 99-112; *Halichoeres socialis* n. sp. (sim. to juv. *H. pictus*) 124-130; *Etheostoma caeruleum* (male color. rel. to female mate choice) 138-148; *Metriacma (zebra, benetos, barlowi)* (female mate choice cues visual but not color-depend.) 181-186; Hawaiian coral reef fishes (195 spp., 49 fams.) (visual sensitiv. to colors incl. UV light) 433-454, (visual ecol.) 467-480; Hawaiian coral reef fishes (51 spp., 19 fams.) (wavelength of color ptns., UV color not rel. to UV vis. sensitiv.) 455-466; *Sauvagesia obesus* (= *ater*) (popn. diff. in color ptn. conspicuousness in natur. environ., ecol. correls.) 481-492; *Conger oceanicus* (chngs. from larv. to juv.) 544-552; *Etheostoma (cervus* n. sp., *pyrrhogaster*) (male nuptial color disting. spp.) 576-582; *Cichlasoma scitulum* n. sp. (disting. n. sp.) 794-802; *Uta stansburiana*, *Urosaurus ornatus*, *Sceloporus (undulatus consobrinus, virgatus, j. jarrovii)* (melanin dens. in skin greater w/blue abdom. color) 858-864.

COMPETITION. *Boidae* (2 spp.), *Colubridae* (15

spp.), Elapidae (*Notechis ater*), Viperidae (12 spp.) (not rel. to body size change on islands) 81–94; *Etheostoma caeruleum* (female mate choice & male compet.) 138–148; *Acanthemblemaria spinosa* (for shelter, gender diff.) 241–247; *Phrynohyas resinifictrix* (male compet. for treeholes in rainfor. canopy) 263–272; *Triturus alpestris* (eff. of rivals on paedomorph & metamorph cshp.) 618–623.

CONSERVATION, *Hybognathus (hankinsoni, placitus)* (clarify histor. distrib. of similar spp. aids conserv. efforts) 1–12; stream fishes (41 spp.) (upstream effs. of dams on fish assemblages) 273–284; *Eurycea cirrigera* (microhab. preferred by larvae deterior. w/ human disturb.) 531–543; *Etheostoma (cervus n. sp., pyrrhogaster)* (vulnerable due to limited ranges) 576–582; *Graptomyx flavimaculata* (mngmnt. plan for threatened sp.) 729–738; *Coregonus (zenithicus, artedi, nippigon)* (smelt introd. impacts cisco popns.) 739–749; *Catostomus* sp. (Salish Sucker) (life hist. charcs., mngmnt. plan for endngrd. sp.) 759–768; *Gambusia clarkhubbsi* n. sp. (extremely rare n. sp., very limited distrib.) 783–788; *Plethodontohyla coronata* n. sp. (depends on undisturbed hab.) 789–793.

DENTITION, *Halichoeres socialis* n. sp. (sim. to juv. *H. pictus*) 124–130; *Conger oceanicus* (chngs. from larv. to juv.) 544–552; *Petromyzontiformes* (the 18 parasitic spp.) (diffs. rel. to blood-feeding vs. flesh-eating) 687–703.

DEVELOPMENT, *Chanos chanos* (of anter. vertebrae, esp. systematic charcs.) 175–180; *Phrynohyas resinifictrix* (entirely in treeholes in rainfor. canopy) 263–272; *Kurtus gulliveri* (descript. of eggs & larvae) 384–390; *Conger oceanicus* (from larv. to juv., loc. of metamorph., diff. stages in diff. habs.) 544–552; *Rana temporaria* (eff. of low pH) 650–656; *Crotalus oreganus concolor* (unusual ontogen. chng. in venom composit.) 769–782; *Pellona harroweri* (ontog. of access. neural arch evid. for homology to otophysan claustrum) 838–845.

DISTRIBUTION, *Hybognathus (hankinsoni, placitus)* (clarify histor. distrib. of similar spp. aids conserv. efforts) 1–12; *Emblemaria australis* n. sp. (notes) 95–98; *Agkistrodon piscivorus leucostoma* (temp. & photoper. effs. on testost. peak timing, implics. for northern range limits) 231–240; stream fishes (41 spp.) (separ. of environ. factors & dams' influence on upstream fish distrib.) 273–284; *Mystus (impluviatus* n. sp., *nigriceps*, *castaneus*) (n. sp. endemic to river drainage, others widespread) 373–378; *Lithogenes (valencia* n. sp., *villoso*) (disjunct distrib. of subfam., biogeogr. hypoth.) 562–575; *Etheostoma (cervus* n. sp., *pyrrhogaster*) 576–582; *Hisonotus insperatus* n. sp. 588–593; *Coregonus (zenithicus, artedi, nippigon)* (ident. of 3 ciscos in inland lakes) 739–749; *Gambusia clarkhubbsi* n. sp. (extremely limited) 783–788; *Lumpenopsis (clitella* n. sp., *pavlenkoi*, *triocellata*, *hypochromis*) (of genus is N. Pacific, 2 spp. in E, 2 spp. in W) 803–809.

DNA FINGERPRINTING, *Sceloporus undulatus* (de-term. reprod. success in wild males, rel. to home range overlap w/females') 113–123.

ECOLOGY, *Anolis auratus*, *Cnemidophorus lemniscatus*, *Kentropyx striata*, *Ameiva ameiva* (lizard stom. conts.: inaccuracy of volume estim. of diff. arthropod orders) 13–19; *Gymnnothorax (moringa, vicinus)* (activ. ptns., diet, shelter sites, weather correls.) 44–55; stream fishes (12 fams., 22 spp.) (fish assemblage struct., Amazon rainfor. stream) 255–262; *Phrynohyas resinifictrix* (treehole-dwelling frogs) 263–272; stream fishes (41 spp.) (separ. of environ. factors & dams' influence on upstream fish assemblages) 273–284; *Cnemidophorus (cryptus, grammivagus, lemniscatus, ocellifer, parecis)* (geogr. var. in many ecol. factors btwn. popns.) 285–298; *Lampropeltis zonata* (feeding ecol.) 308–314; *Dasyatis sabina* (ecol. interpret. of wide thermal toler.) 315–325; *Clinocottus (globiceps, analis)* (ecol. correls. of sp. diff. in beh. resp. to hypoxia) 397–401; Hawaiian coral reef fishes (195 spp., 49 fams.) (visual ecol.) 467–480; *Eurycea cirrigera* (stream & seas. diff. in microhab. use by larvae) 531–543; *Conger oceanicus* (hab. chngs. larv. to juv.) 544–552; *Leucoraja erinacea* (skate com.: pushing off substrate & gliding, ecol. advntgs.) 553–561; *Creagrutus tuyuka* n. sp. (notes) 583–587; Apogonidae (assemblage struct. differs btwn. Atlantic & Pacific Oceans) 608–617; *Lythrurus roseipinnis* (exploit. of floodplain by stream fish) 635–645; *Graptomyx flavimaculata* (unusual reprod. ecol. of threatened sp., mngmnt. suggests.) 729–738; *Coregonus (zenithicus, artedi, nippigon)* (up to 3 sympat. ciscos in inland lakes, ecol. hypoths.) 739–749.

EGGS, *Acanthemblemaria spinosa* (compet. for shelters, gender diff. rel. to male egg-guarding) 241–247; *Phrynohyas resinifictrix* (descript., laid in treeholes, food for conspec. larvae) 263–272; *Chrysemys picta* (nest-site temper. choice not rel. to egg size) 366–372; *Rana sphenocephala* (hitchng. accel. in presence of crayfish pred.) 646–649; *Rana temporaria* (eff. of low pH on hitchng. success) 650–656; *Podarcis hispanica* (clutch charcs. in island popn.) 657–665.

ENDANGERED SPECIES, *Hybognathus (hankinsoni, placitus)* (clarify histor. distrib. of similar spp. aids conserv. efforts) 1–12; *Euproctis platycephalus* (popn. struct. & sex. dimorph. in endngrd. sp.) 149–154; *Bufo boreas* (home ranges & mvmnts. in undist. hab., mngmnt. implics.) 160–165; *Graptomyx flavimaculata* (reprod. & nesting ecol. of threatened sp., mngmnt. plan) 729–738; *Catostomus* sp. (Salish Sucker) (life hist. charcs., mngmnt. plan for endngrd. sp.) 759–768.

EVOLUTION, Boidae (2 spp.), Colubridae (15 spp.), Elapidae (*Notechis ater*), Viperidae (12 spp.) (of body size change on islands) 81–94; *Menidia peninsulae* (temp.-depend. sex determ. adaptive) 155–159; *Metriacma (zebra, benetos, barlowi)* (female mate choice in spp. flock, cues are visual) 181–186; *Xiphophorus (birchmanni, malinche, birchmanni × malinche)* (of sexual signaling systems) 299–307; *Sauromalus obesus* (= *ater*) (popn. diff., in color ptn. conspicuousness rel. to sex. select.) 481–492; *Rana temporaria* (evid. of adapt. to low pH) 650–656; *Podarcis hispanica* (no reprod. diff.).

in island popn.) 657-665; *Petromyzontiformes* (the 18 parasitic spp.) (flesh-eating evolved from blood-feeding, var. in retina rel. to adult microhab. pref.) 687-703; *Coregonus* (*zenithicus*, *artedi*, *nipigon*) (evol. & histor. biogeogr. hypoths. for presence of 3 ciscos in inland lakes) 739-749; *Litoria verreauxii* (large geogr. var. in calls, hypoths. for charc. displcmnt., environ. effs., possible cryptic spp.) 750-758; *Crotalus oreganus concolor* (selection for chngs. in venom composit. w/age) 769-782; *Pellona harroweri* (of Weberian appar. claus-trum of higher teleosts) 838-845.

EXTINCTION, *Lithogenes* (*valencia* n. sp., *villosum*) (n. sp. probably extinct due to severe degrad. of lake basin) 562-575.

FECUNDITY, *Graptemys flavimaculata* (low fec. of threatened sp., mngrmnt. plan) 729-738.

FEEDING, *Gymnothorax* (*moringa*, *vicinus*) (prey types, weather correls.) 44-55; *Lampropeltis zonata* (feeding ecol.) 308-314; *Lythrurus roseipinnis* (stream fish moves to floodplain to feed) 635-645; *Petromyzontiformes* (the 18 parasitic spp.) (blood-feeding ancestral in lampreys) 687-703; *Hymenochirus boettgeri* (beh. ptms. & kinematics of suction feeding in frog) 879-886.

FOOD, *Anolis auratus*, *Cnemidophorus lemniscatus*, *Ken-tropyx striata*, *Ameiva ameiva* (lizard stom. conts.: inaccuracy of volume estim. of diff. arthropod orders) 13-19; *Gymnothorax* (*moringa*, *vicinus*) (stom. conts., weather correls.) 44-55; *Ambystoma tigrinum nebulosum* (macroinvert. prey cues cannib. in larval salamanders) 56-67; *Halichoeres socialis* n. sp. (zooplankton like *H. pictus*) 124-130; *Phrynohyas resinifex* (diet of larvae in treeholes mostly conspec. eggs) 263-272; *Cnemidophorus* (*cryptus*, *gramivagus*, *lemniscatus*, *ocellifer*, *parecis*) (geogr. var. in diet & other ecol. factors btwn. popns.) 285-298; *Lythrurus roseipinnis* (greater food avail. on floodplain than in stream) 635-645; *Crotalus oreganus concolor* (chngs. in venom composit. w/develop. chng. in diet) 769-782; *Cichlasoma* (*scitulum* n. sp.) (snail diet) 794-802.

GENETICS, *Ameiurus* (7 spp.) (conflict btwn. morph. & genetic charcs. for clades) 20-33; *Sceloporus undulatus* (male home range overlap w/females' 50% correl. w/reprod. success, DNA data) 113-123; *Macropybopsis aestivalis* sp. complex (*australis*, *tetranema*, *hyostoma*) (gen. var., introgres. hybrid.) 493-501; *Leuresthes tenuis* (panmictic popn. struct., alloz. data) 594-600.

GEOGRAPHIC LOCALITIES,
 Alabama, *Ameiurus* (*brunneus*, *catus*, *nebulosus*) 20-33; *Pseudotriton ruber* 704-713.
 Alaska, *Liparis rutteri* 818-823.
 Arabian Sea, *Pachycara* (*shcherbachevi*, *andersoni* n. sp., *arabica* n. sp.) 357-365.
 Argentina, *'Cichlasoma'* (*scitulum* n. sp.) 794-802.
 Arizona, *Sauromalus obesus* (= *ater*) 481-492; *Ambystoma tigrinum stebbinsi*, *Rana* (*yavapaiensis*, *boylei*) 601-607; *Sceloporus* (*virgatus*, *j. jarrovii*) 858-864.
 Arkansas, *Agiptostrodon piscivorus leucostoma* 231-240; *Cottus* (*hypselurus*, sp. cf. *hypselurus*) 624-627.

Atlantic Ocean, *Apogonidae* 608-617.
 Australia, *Crinia georgiana* (WA) 248-254; *Kurtus gulliveri* (NT) 384-390; *Litoria verreauxii* (NSW, ACT) 750-758; *Carettochelys insculpta* (NT) 894-898.

Bay of Bengal, *Pachycara shcherbachevi* 357-365.
 Belize, *Gymnothorax* (*moringa*, *vicinus*) 44-55; *Halichoeres socialis* n. sp. 124-130; *Acanthemblemaria spinosa* 241-247; *Apogonidae* 608-617.

Bering Sea, *Liparis rutteri* 818-823.
 Borneo, *Myctis* (*impluviatus* n. sp., *castaneus*) 373-378.

Brazil, *Emblemaria australis* n. sp. 95-98; *Megaelosia* (*massarti*, *boticariana*, *lutzae*) 166-174; stream fishes (12 fams., 22 spp.) 255-262; *Phrynohyas resinifex* 263-272; *Cnemidophorus* (*cryptus*, *gramivagus*, *lemniscatus*, *ocellifer*, *parecis*) 285-298; *Apareiodon* (*machrisi*, *argenteus* n. sp., *cavalcantei* n. sp., *tinctorius* n. sp.) 337-348; *Phrynohyas lepida* n. sp. 379-383; *Creagrutus* (*tuuuka* n. sp., *amoenus*, *kunthurus*) 583-587; *Hisonotus insperatus* n. sp. 588-593; *Caiman crocodilus yacare* 628-634; *'Cichlasoma'* (*scitulum* n. sp.) 794-802.

Burundi, *Cyphotilapia frontosa* 824-832.

California, *Lampropeltis zonata* 308-314; *Pituophis catenifer* 391-396; *Clinocottus* (*globiceps*, *analisis*) 397-401; *Esselenia* = *Esselenichthys* 414; *Leuresthes tenuis* 594-600; *Lumpenopsis clittella* n. sp. 803-809; *Liparis adiastolus* n. sp. 818-823.

Canada, *Bufo* (*americanus*, *fowleri*) (Ont.) 34-43; *Crotalus* (*zenithicus*, *artedi*, *nipigon*) (Ont.) 739-749; *Catostomus* sp. (Salish Sucker) (Brit. Col.) 759-768; *Lumpenopsis hypochromis* (Brit. Col.) 803-809; *Liparis adiastolus* n. sp. (Brit. Col.) 818-823.

Caribbean Sea, *Ostracion knorri* = *Antennarius striatus* 187-189.

Colorado, *Hybognathus* (*hankinsoni*, *placitus*) 1-12; *Ambystoma tigrinum nebulosum* 56-67; *Bufo boreas* 160-165; *Crotalus oreganus concolor* 769-782.

Congo, Democratic Republic, *Cyphotilapia* (*gibberosa* n. sp., *frontosa*) 824-832.

Florida, *Ameiurus serracanthus* 20-33; *Menidia peninsulae* 155-159; *Dasyatis sabina* 315-325; *Anolis sagrei* 502-511.

France, *Triturus alpestris* 618-623.

Georgia, *Ameiurus brunneus* 20-33; *Eurycea cirrigera* 531-543; *Gopherus polyphemus* 846-850.

Germany, *Rana temporaria* 650-656.

Hawaii, *Caranxanthus typicus* 68-80; coral reef fishes (195 spp., 49 fams.) 433-454, 455-466, 467-480; *Apogonidae* 608-617.

Honduras, *Apogonidae* 608-617.

Illinois, *Ameiurus* (*melas*, *natalis*, *nebulosus*) 20-33; *Chrysemys picta* 366-372.

Indian Ocean, *Pachycara* (*shcherbachevi*, *andersoni* n. sp., *arabica* n. sp.) (Arabian Sea) 357-365; *Rhombobus coecensis* = *Asterorhombus coecensis* 833-837.

Indonesia, *Myctis* (*impluviatus* n. sp. [Bor.], *nigriiceps* [Java, Sum.], *castaneus* [Bor., Sum.]) 373-378; *Symphurus bathysphilus* n. sp. 810-817.

Iowa, *Macropybopsis hyostoma* 493-501.

Italy, *Eupercus platycephalus* 149-154.

Japan, *Lumpenopsis* (*pavlenkoi*, *tricellata*) 803-809.

Kansas, *Macrhybopsis aestivalis* sp. complex (*tetranema, hyostoma*) 493–501.

Kentucky, *Ameiurus natalis* 20–33; *Etheostoma* (*Catotus*) (*virgatum, derivativum* n. sp.) 512–530; *Etheostoma pyrrhogaster* 576–582.

Lake Malawi, *Metriaclima* (*zebra, benetos, barlowi*) 181–186.

Lake Tanganyika, *Cyphotilapia* (*gibberosa* n. sp., *frontosa*) 824–832.

Louisiana, *Notropis* (*wickliffei, blennius, texanus, maculatus*), *Macrhybopsis, storriiana, Pimephales notatus* 851–857.

Madagascar, *Plethodontohyla coronata* n. sp. 789–793; *Engyprosopon mozambiquensis* n. sp. 833–837.

Maine, *Leucoraja erinacea* 553–561.

Malawi, *Metriaclima* (*zebra, benetos, barlowi*) 181–186.

Malaysia, *Mystus castaneus* (Mal., Sar.) 373–378.

Mexico, *Xiphophorus* (*birchmanni, malinche, birchmanni × malinche*) (Hid.) 299–307; *Lampropeltis zonata* (Baja Cal.) 308–314.

Michigan, *Etheostoma caeruleum* 138–148; *Chrysemys picta marginata* 326–336.

Minnesota, *Coregonus* (*zenithicus, artedi, nippigon*) 739–749.

Mississippi, *Lythrurus roseipinnis* 635–645; *Graptemys flavimaculata* 729–738; *Cyprinella* (*venusta, camura*), *Notropis longirostris* 851–857.

Missouri, *Macrhybopsis hyostoma* 493–501; *Cottus* (*hypselurus*, sp. cf. *hypselurus*) 624–627.

Mozambique, *Engyprosopon mozambiquensis* n. sp. 833–837.

Myanmar, *Engyprosopon mozambiquensis* n. sp. 833–837.

New Jersey, *Sceloporus undulatus* 99–112, 113–123; *Conger oceanicus* 544–552.

New Mexico, *Macrhybopsis aestivalis* sp. complex (*tetranema, aestivalis*) 493–501; *Uta stansburiana, Urosaurus ornatus, Sceloporus undulatus consobrinus* 858–864.

New York, *Ameiurus nebulosus* 20–33.

Nicobar Is., *Engyprosopon mozambiquensis* n. sp. 833–837.

North Carolina, *Ameiurus platycephalus* 20–33.

Ohio, *Ambystoma maculatum* 887–893.

Oklahoma, *Macrhybopsis aestivalis* sp. complex (*australis, hyostoma*) 493–501.

Oregon, *Lampropeltis zonata* 308–314; *Dicamptodon tenebrosus, Onychorhynchus clarki* 402–407; *Liparis adiastolus* n. sp. 818–823.

Pacific Ocean, *Apogonidae* 608–617; *Lumpenopsis* (*clitella* n. sp. [NE], *pavlenkoi* [NW], *trioicellata* [NW], *hypochromis* [NE]) 803–809.

Papua-New Guinea, *Caracanthus unipinna* 68–80.

Peru, *Phrynohyas resinifictrix* 263–272.

Philippines, *Syphurus bathysphilus* n. sp. 810–817; *Engyprosopon mozambiquensis* n. sp. 833–837.

Portugal, *Vipera latastei* 865–871.

Puerto Rico, *Apogonidae* 608–617.

Russia, *Lumpenopsis pavlenkoi* 803–809.

Sardinia, *Euproctus platycephalus* 149–154.

Spain, *Emys orbicularis, Mauremys leprosa, Bufo calamita, Hyla meridionalis, Rana perezi, Pelobates cultripes* 349–356; *Acanthodactylus erythrurus* 408–413; *Podarcis hispanica* 657–665; *Podarcis muralis* 899–905.

Taiwan, *Chanos chanos* 175–180.

Tanzania, *Cyphotilapia* (*gibberosa* n. sp., *frontosa*) 824–832.

Tennessee, *Etheostoma* (*Catotus*) (*basilare* n. sp., *derivativum* n. sp.) 512–530; *Etheostoma* (*cervus* n. sp., *pyrrhogaster*) 576–582; *Anolis carolinensis* 906–909.

Texas, stream fishes (41 spp.) 273–284; *Macrhybopsis aestivalis* sp. complex (*australis, tetranema, hyostoma, maronis*) 493–501; *Rana sphenocephala* 646–649; *Gambusia clarkhubbsi* n. sp. 783–788.

Uruguay, *Cichlasoma* (*scitulum* n. sp.) 794–802.

Utah, *Crotalus oreganus concolor* 769–782.

Venezuela, *Lithogenes* (*valencia* n. sp., *villosum*) 562–575.

Washington, *Lampropeltis zonata* 308–314; *Liparis adiastolus* n. sp. 818–823.

Wyoming, *Crotalus oreganus concolor* 190–194; *Crotalus oreganus concolor* 769–782.

Zambia, *Cyphotilapia gibberosa* n. sp. 824–832.

GROWTH, *Catostomus* sp. (Salish Sucker) (& other life hist. chars., mgmt. plan for endngd. sp.) 759–768; *Vipera latastei* (gender diff., eff. of mortal. diff. on adult sex. size dimorph.) 865–871; *Varanus bengalensis* (age assess. w/vertebral growth rings) 872–878; *Anolis carolinensis* (body growth in winter aggreg. in north. popn.) 906–909.

HABITAT, *Gymnnothorax* (*moringa, vicinus*) (shelter sites, feeding hab., weather corrls.) 44–55; *Emblemaria australis* n. sp. (notes) 95–98; *Halichoeres socialis* n. sp. 124–130; *Euproctus platycephalus* (juvs. not found in streams w/adults) 149–154; *Bufo boreas* (home ranges & mvmnts. in undist. hab.) 160–165; stream fishes (12 fams., 22 spp.) (hab. eff. on fish assemblage, Amazon rainfor. stream) 255–262; *Phrynohyas resinifictrix* (tree-holes in rainfor. canopy) 263–272; *Cnemidophorus* (*cryptus, grammivagus, lemniscatus, ocellifer, parecis*) (geogr. var. in microhab. btwn. popns.) 285–298; *Pituophis catenifer* (use of *Microtus* runways) 391–396; *Eurycea cirrigera* (stream & seas. diff. in microhab. use by larvae) 531–543; *Conger oceanicus* (diff. stages of devel. larv. to juv. in diff. hab.) 544–552; *Etheostoma cervus* n. sp. (notes) 576–582; *Hisonotus insperatus* n. sp. (descript.) 588–593; *Apogonidae* (assemblage struct. differs btwn. Atlantic & Pacific Oceans) 608–617; *Rana temporaria* (evid. of adapt. to low pH) 650–656; *Petromyzontiformes* (the 18 parasitic spp.) (adult preferred microhab. rel. to evol. of retina) 687–703; *Gambusia clarkhubbsi* n. sp. (notes) 783–788; *Plethodontohyla coronata* n. sp. (notes) 789–793; *Cichlasoma* (*scitulum* n. sp. (notes) 794–802; *Syphurus bathysphilus* n. sp. (depth) 810–817).

HERMAPHRODITISM, *Caracanthus* (*typicus, unipinna*) (unusual gonads of protogyn. hermaphr. caracanthids sim. to 3 scorpaenids) 68–80.

HISTOLOGY, *Caracanthus* (*typicus, unipinna*) (unusual gonads of protogyn. hermaphr. caracanthids sim. to 3 scorpaenids) 68–80; *Ambystoma tigrinum*

stebbinsi, *Rana (yavapaiensis, boylii)* (chytrid fungal infection) 601–607.

HOME RANGE, *Gymnnothorax (moringa, vicinus)* 44–55; *Sceloporus undulatus* (male home range size rel. to body size & overlap w/female ranges) 99–112, (male home range overlap w/females' 50% correl. w/reprod. success, DNA data) 113–123; *Bufo boreas* (females' much larger than males') 160–165; *Crotalus oreganus concolor* (smaller than in other popns.) 190–194; *Pituophis catenifer* (radio-tracked males) 391–396; *Anolis sagrei* (prevention of dewlap extension not aff. male home range) 502–511; *Catostomus* sp. (Salish Sucker) (& other life hist. charcs., mngmnt. plan for endngrd. sp.) 759–768.

HYBRIDIZATION, *Bufo (americanus, fowleri)* (variable long-term hybrid zones) 34–43; *Xiphophorus (birchmanni, malinche, birchmanni × malinche)* (sexual signaling in hybrid zone) 299–307; *Machyobopsis aestivalis* sp. complex (*australis*, *tetranema*, *hyostoma*) (*M. australis*, *tetranema* sister spp., introgress. hybrid. w/*M. hyostoma*) 493–501.

LARVAE, *Ambystoma tigrinum nebulosum* (macroinvert. prey cues cannib. in larval salamanders) 56–67; *Chana chanos* (devel. of anter. vertebrae, esp. systematic charcs., larval & juv. stages) 175–180; *Phrynobatrachus resinifictrix* (in treeholes in rainfor. canopy) 263–272; *Emys orbicularis*, *Mauremys leprosa*, *Bufo calamita*, *Hyla meridionalis*, *Rana perezi*, *Pelobates cultripes* (eff. of turtle pred. on anuran larvae, size & palatability effs.) 349–356; *Kurtus gulliveri* (descript. of eggs & larval devel.) 384–390; *Dicamptodon tenebrosus*, *Oncorhynchus clarki* (chem. cues in salamander larv. def. against trout pred.) 402–407; *Eurycea cirrigera* (stream & seas. diff. in microhab. use by larvae) 531–543; *Conger oceanicus* (metamorph. to juv. diff. stages in diff. habs.) 544–552; *Rana temporaria* (eff. of low pH on devel.) 650–656.

LIFE HISTORY, *Gymnnothorax (moringa, vicinus)* (activ., diet, shelter sites) 44–55; *Phrynobatrachus resinifictrix* (of treehole-dwelling frogs) 263–272; *Cnemidophorus (cryptus, grammivagus, lemniscatus, ocellifer, parensis)* (geogr. var. in life hist. ptns. btwn. popns.) 285–298; *Chrysemys picta marginata* (geogr. eff. on reprod. parameters) 326–336; *Kurtus gulliveri* (descript. of eggs & larval devel.) 384–390; *Podarcis hispanica* (reprod. charcs. in island popn.) 657–665; *Catostomus* sp. (Salish Sucker) (life hist. charcs., mngmnt. plan for endngrd. sp.) 759–768.

LIGHT, *Aigisthodon piscivorus leucostoma* (photoper. and temp. effs. on testost. peak timing, implics. for northern range limits) 231–240; Hawaiian coral reef fishes (195 spp., 49 fams.) (vis. sensitiv., incl. to UV light) 433–454, (coral reef environ. light, microhab. diff., rel. to vis. ecol.) 467–480; Hawaiian coral reef fishes (51 spp., 19 fams.) (wavelength of color ptns., UV color not rel. to UV vis. sensitiv.) 455–466.

LOCOMOTION, *Cerastes (cerastes, vipera)* (mechanics of vertical burrowing) 131–137; *Leucoraja erinacea* (pushing off substrate & gliding, anal. of pelvic fin anat. & mvmnts.) 553–561; *Caiman crocodilus yacare* (coord. terrest. group mvmnts.) 628–634; *Pseudotriton ruber* (diffs. btwn. aquat. & terrest. loc. rel. to temp. & body size) 704–713; Cyprinids (9 spp. in 4 gen.) (oral grasping to maintain position in flowing water) 851–857; *Ambystoma maculatum* (gender diff., in swim & crawl speeds in breeding seas.) 887–893.

METHODS, *Anolis auratus*, *Cnemidophorus lemniscatus*, *Kentropyx striata*, *Ameiva ameiva* (lizard stom. conts.: inaccuracy of volume estim. of diff. arthropod orders) 13–19; *Varanus bengalensis* (age assess. w/vertebral growth rings) 872–878.

MIGRATION, *Conger oceanicus* (larval migr. into estuaries occurs w/metamorph. into juvs.) 544–552.

MITOCHONDRIAL DNA, *Ameiurus* (7 spp.) (conflict btwn. morph. & genetic charcs. [both mtDNA & nuclear DNA]) 20–33; *Etheostoma (Catonotus) (virgatum, basilare n. sp., derivativum n. sp.)* (clad. anal. of *Catonotus* (7 spp.), mDNA & nDNA data, *E. virgatum* shown to be 3 spp.) 512–530; *Cottus (hypselurus, sp. cf. hypselurus)* (mtDNA indicates 2 spp.) 624–627.

MORPHOLOGY, *Hybognathus (hankinsoni, placitus)* (morph. charcs. identifying similar spp. aids conserv. efforts) 1–12; *Ameiurus* (7 spp.) (conflict btwn. morph. & genetic charcs. for clades) 20–33.

NESTING, *Chrysemys picta marginata* (seas. aff. by temper.) 326–336; *Chrysemys picta* (nest-site temper. choice not rel. to egg size) 366–372; *Graptemys flavimaculata* (unusual nesting ecol. of threatened sp., mngmnt. suggests.) 729–738; *Carettochelys insculpta* (grouping of nests not reduce pred. on individual nests, hypoth. of advntg. for grouping of nests) 894–898.

NOMENCLATURE, *Ostracion knorri* = *Antennarius striatus* (*O. knorri* invalid by "reversal of precedence") 187–189; *Esselenichthys* (replacement name for junior homonym) 414; *Danio* (sensu lato), *Bradydania* (*Danio* paraphylet., raise *D. devario* to genus *Devario*, several *Danio* spp. chngd. to *Devario*, *Bradydania* syn. to *Danio*) 714–728; *Lumpenopsis* (*clitella* n. sp., *pavlenkoi*, *triocellata*, *hypochromis*) (monotypic *Allolumpenus* is junior syn. of *Lumpenopsis*) 803–809; *Syphurus (bathysphilus* n. sp., *woodmasoni*) (most specimens of *S. woodmasoni* are *S. bathysphilus*) 810–817; *Liparis (adiastolus* n. sp., *rutteri*) (rediagn. *L. rutteri*, specimens of *L. rutteri* from Washington southward are all *L. adiastolus*) 818–823; *Rhombus cocomensis* = *Asterorhombus cocomensis*, *Engyprosopon mozaambiquense* n. sp. (holotype of *R. cocomensis* found, is actually *A. cocomensis*, n. sp. name for specimen misident. as *A. cocomensis*) 833–837.

NUCLEAR DNA, *Ameiurus* (7 spp.) (conflict btwn. morph. & genetic charcs. [both mtDNA & nuclear DNA]) 20–33; *Etheostoma (Catonotus) (virgatum, basilare n. sp., derivativum n. sp.)* (clad. anal. of *Catonotus* (7 spp.), mDNA & nDNA data, *E. virgatum* shown to be 3 spp.) 512–530.

OLFACTION, *Metriaclima (zebra, benetos, barlowi)* (female mate choice in spp. flock, cues are visual, not olf.) 181–186; *Dicamptodon tenebrosus*, *Oncorhynchus clarki* (chem. cues in salamander larv. def. against trout pred.) 402–407.

OSTEOLOGY, *Chanos chanos* (devel. of anter. vertebrae, esp. systematic charcs.) 175–180; *Pellona harroweri* (otophysan claustrum homolog. to access. neural arch of lower teleosts) 838–845.

PAEDOMORPHISM, *Triturus alpestris* (no diffs. in ctshp. btwn. paedomorphs & metamorphs) 618–623; *Crotalus oreganus concolor* (in ontogen. chngs. in venom composit.) 769–782.

PARASITES, *Ambystoma tigrinum stebbinsi*, *Rana (yavapaiensis, boylii)* (chytrid fungus infect., transfer btwn. salamanders & frogs) 601–607; Petromyzontiformes (the 18 parasitic spp.) (phyl. anal. of paras. lampreys, blood-feeding ancestral) 687–703.

PATHOGENS, *Ambystoma tigrinum stebbinsi*, *Rana (yavapaiensis, boylii)* (chytrid fungus infect., transfer btwn. salamanders & frogs) 601–607.

PHYLOGENETIC ANALYSIS, *Ameiurus* (7 spp.) (clad. anal., conflict btwn. morph. & genetic charcs. for clades) 20–33; *Macrhybopsis aestivalis* sp. complex (*australis*, *tetranema*, *hyostoma*, *aestivalis*, *marconis*) (clad. anal., alloz. data, sister spp., introgress. hybrid.) 493–501; *Etheostoma (Catonotus)* (*virgatum*, *basilare* n. sp., *derivatum* n. sp.) (clad. anal. of *Catonotus* (7 spp.), mtDNA & nDNA data, *E. virgatum* shown to be 3 spp.) 512–530; *Creagrutus (iuyuka* n. sp., *amoenus*, *kunturus*) (n. sp. sister to *C. amonous* & *C. kunturus*, phyl. notes) 583–587; *Cottus (hypselurus)*, sp. cf. *hypselurus* (clad. anal. indicates 2 spp., mtDNA data) 624–627; Petromyzontiformes (the 18 parasitic spp.) (clad. anal., determ. of monophly & sister groups, morph. data) 687–703; *Danio* (sensu lato), *Bradydanio* (clad. anal., *Danio* paraphylet., raise *D. devario* to genus *Devario*, several *Danio* spp. chngd. to *Devario*, *Bradydanio* syn. to *Danio*, sister groups, morph. charcs.) 714–728.

PHYSIOLOGY, *Agkistrodon piscivorus leucostoma* (temp. & photoper. effs. on testost. peak timing, implics. for northern range limits) 231–240; *Dasysaurus sabina* (unique thermal toler.: focus on cold acclimation) 315–325.

POPULATIONS, *Bufo (americanus, fowleri)* (hybrid. in sympat. popns. in some places, not others) 34–43; *Boidae* (2 spp.), *Colubridae* (15 spp.), *Elapidae* (*Notechis ater*), *Viperidae* (12 spp.) (body size change in island popns.) 81–94; *Euproctis platycephalus* (popn. struct. in large breeding popn. of endngd. salamander) 149–154; *Menidia peninsulae* (popn. var. in temp.-depend. sex determ.) 155–159; *Crotalus oreganus concolor* (mating beh. & mvmnts. shorter than in other popns.) 190–194; *Cnemidophorus (cryptus, gramiavagus, lemniscatus, ocellifer, parecis)* (geogr. var. in many ecol. factors btwn. popns.) 285–298; *Emys orbicularis*, *Mauremys leprosa*, *Bufo calamita*, *Hyla meridionalis*, *Rana perezi*, *Pelobates cultripes* (eff. on prey popn. struct. of turtle pred. on anuran larvae) 349–356; *Sau-*

romalus obesus (=ater) (popn. diffs. in color ptnn. conspicuousness in natur. environ., ecol. corrls.) 481–492; *Leuresthes tenuis* (panmictic popn. struct., alloz. data) 594–600; *Podarcis hispanica* (no reprod. diff. in island popn.) 657–665; *Litoria verreauxii* (large geogr. var. in calls, some rel. to sympatry w/ *L. ewingii*, some w/out sympatry) 750–758; *Anolis carolinensis* (body growth in winter aggreg. in north. popn.) 906–909.

PREDATION, *Anolis auratus*, *Cnemidophorus lemniscatus*, *Kentropyx striata*, *Ameiva ameiva* (lizard stom. conts.: inaccuracy of volume estim. of diff. arthropod orders) 13–19; *Gymnophorax (morninga, vicinus)* (prey types, weather corrls.) 44–55; *Ambystoma tigrinum nebulosum* (macroinverte. prey cues cannib. in larval salamanders) 56–67; *Boidae* (2 spp.), *Colubridae* (15 spp.), *Elapidae* (*Notechis ater*), *Viperidae* (12 spp.) (prey size/body size change on islands) 81–94; *Phrynohyas resinifex* (pred. is main factor causing reprod. in treeholes) 263–272; *Lampropeltis zonata* (feeding ecol.) 308–314; *Emys orbicularis*, *Mauremys leprosa*, *Bufo calamita*, *Hyla meridionalis*, *Rana perezi*, *Pelobates cultripes* (eff. of turtle pred. on anuran larvae, size & palatability effs.) 349–356; *Pituophis catenifer* (use of *Microtus* runways) 391–396; *Dicamptodon tenebrosus*, *Oncorhynchus clarki* (chem. cues in salamander larv. def. against trout pred.) 402–407; *Acanthodactylus erythrurus* (resp. to repeated pred. attacks) 408–413; *Sauromalus obesus* (=ater) (popn. diffs. in color ptnn. conspicuousness rel. to pred.) 481–492; *Leucoraja erinacea* (skate locom.: pushing off substrate & gliding, rel. to pred. & escape from pred.) 553–561; *Lythrus roseipinnis* (exploit. of prey in floodplain by stream fish) 635–645; *Rana sphenocephala* (hitchng. accel. in presence of crayfish pred.) 646–649; Petromyzontiformes (the 18 parasitic spp.) (parasitism: blood feeding vs. flesh-eating) 687–703; *Graptemys flavimaculata* (high nest. mortal. by fish crow pred.) 729–738; *Crotalus oreganus concolor* (chngs. in venom composit. w/ devel. chng. in diet) 769–782; *Hymenochirus boettgeri* (beh. ptns. & kinematics of suction feeding in frog) 879–886; *Carettochelys insculpta* (grouping of nests not reduce pred. on individual nests, hypoths. of advntg. for grouping of nests) 894–898; *Podarcis muralis* (anti-pred. response depends on intens. of pred. & refuge temp.) 899–905.

REPRODUCTION, *Caracanthus (typicus, unipinnna)* (unusual gonads of protogyn. hermaphr. caracathids sim. to 3 scorpaenids) 68–80; *Sceloporus undulatus* (male home range size rel. to ctshp. beh., plasma steroids) 99–112; *Sceloporus undulatus* (male home range overlap w/ females' 50% correl. w/ reprod. success, DNA data) 113–123; *Etheostoma caeruleum* (female mate choice & male compet.) 138–148; *Metriaclima (zebra, benetos, barlowi)* (female mate choice in spp. flock, cues are visual) 181–186; *Crotalus oreganus concolor* (mating beh. & mvmnts. shorter than in other popns.) 190–194; *Agkistrodon piscivorus leucostoma* (temp. & photoper. effs. on testost. peak timing, implics. for northern range limits) 231–240; *Acanthemble-*

maria spinosa (compet. for shelters, gender diff. rel. to male egg-guarding) 241–247; *Crinia georgiana* (energy consumpt. & other factors in indiv. var. in male calls) 248–254; *Phrynohyas resinifictrix* (calls & tdlp. dev. entirely in trecholes in rainfor. canopy) 263–272; *Cnemidophorus (cryptus, grammivagus, lemniscatus, ocellifer, parecis)* (geogr. var. in reprod. seas. & clutch size btwn. popns.) 285–298; *Xiphophorus (birchmanni, malinche, birchmanni × malinche)* (evol. of sexual signaling systems) 299–307; *Chrysemys picta marginata* (geogr. & environ. effs. on reprod. parameters) 326–336; *Anolis sagrei* (prevention of dewlap extension not aff. male-male interact.) 502–511; *Triturus alpestris* (no diff. in cshp. btwn. paedomorphs & metamorphs) 618–623; *Rana temporaria* (eff. of low pH) 650–656; *Podarcis hispanica* (seas., clutch charcs. in island popn.) 657–665; *Graptemys flavimaculata* (unusual reprod. ecol. of threatened sp., mngrnt. suggests.) 729–738; *Catostomus* sp. (Salish Sucker) (& other life hist. charcs., mngrnt. plan for endngrd. sp.) 759–768; *Gopherus polyphemus* (evid. for scramble compet. rather than harem defence polygyny) 846–850; *Ambystoma maculatum* (gender diff. in locom speed & met. rate rel. to diff. in reprod. activ.) 887–893; *Carettochelys insculpta* (grouping of nests not reduce pred. on individual nests, hypoth. of advntg. for grouping of nests) 894–898.

RESPIRATION, *Clinocottus (globiceps, analis)* (sp. diff. in beh. resp. to hypoxia) 397–401; *Ambystoma maculatum* (gender diff. in met. rate rel. to diff. in reprod. activ.) 887–893.

SEX, *Menidia peninsulae* (temp.-depend. sex determ.) 155–159; *Chrysemys picta* (nest-site choice & temper.-depend. sex determ.) 366–372; *Anolis carolinensis* (sex ratio of winter aggregs.) 906–909.

SEXUAL DIMORPHISM, *Emblemaria australis* n. sp. (in several charcs.) 95–98; *Euproctis platycephalus* (in size & shape, males larger) 149–154; *Sauromalus obesus* (=ater) (popn. diff. in color ptn, conspicuousness, gender diff.) 481–492; *Hisonotus insperatus* n. sp. (in pelvic fins & urogen. papillae) 588–593; *Catostomus* sp. (Salish Sucker) (females larger, not found in all *Catostomus*) 759–768; *Vipera latastei* (males larger but greater mortal. in males reduces sex. size dimorph. of popn.) 865–871; *Ambystoma maculatum* (gender diff. in size rel. to diff. in locom speeds & met. rate) 887–893.

SIZE, *Ambystoma tigrinum nebulosum* (larval body size var. rel. to cannib.) 56–67; *Boidae* (2 spp.), *Colubridae* (15 spp.), *Elapidae* (*Notechis ater*), *Viperidae* (12 spp.) (prey size/body size change on islands) 81–94; *Sceloporus undulatus* (male body size rel. to home range size, cshp. beh., status) 99–112; *Halichoeres socialis* n. sp. (smallest in genus) 124–130; *Euproctis platycephalus* (sex. size dimorph., males larger) 149–154; *Cnemidophorus (cryptus, grammivagus, lemniscatus, ocellifer, parecis)* (geogr. var. in body size btwn. popns.) 285–298; *Chrysemys picta marginata* (matern. body size aff. reprod. charcs.) 326–336; *Emys orbicularis*, *Mau-*

remys leprosa, *Bufo calamita*, *Hyla meridionalis*, *Rana perezi*, *Pelobates cultripes* (eff. of turtle pred. on anuran larvae, eff. of size of larvae) 349–356; *Chrysemys picta* (nest-site temper. choice not rel. to egg size) 366–372; *Conger oceanicus* (larv.-juv. metamorph. stage determ. by proportion assoc. w/develop. state rather than total length) 544–552; *Pseudotriton ruber* (diffs. btwn. aquat. & terrest. locom. rel. to temp. & body size) 704–713; *Vipera latastei* (& age at sex. matur., males larger but greater mortal. in males reduces sex. size dimorph. of popn.) 865–871.

SURVIVAL, *Ambystoma tigrinum stebbinsi*, *Rana (yavapaiensis, boylii)* (w/chytrid fungal infect.) 601–607; *Graptemys flavimaculata* (low nest. surv. of threatened sp.) 729–738.

SYSTEMATICS, *Emblemaria australis* n. sp. (n. sp., compare to congeners) 95–98; *Halichoeres socialis* n. sp. (smallest in genus, unusual schooling beh., very sim. to juv. *H. pictus*) 124–130; *Chanos chanos* (devel. of anter. vertebrae, esp. systematic charcs.) 175–180; *Apareiodon (machrisi, argenteus* n. sp., *cavalcante* n. sp., *tigrinus* n. sp.) (3 n. spp. in headwaters, redescript. of *A. machrisi*, key to spp.) 337–348; *Pachycara (shcherbachevi, andersoni* n. sp., *arabica* n. sp.) (n. spp. & redesc. *P. shcherbachevi* w/ compar. to congeners) 357–365; *Mystus (impluviatus* n. sp., *nigriiceps*, *castaneus*) (n. sp., compare to rels.) 373–378; *Phrynohyas lepida* n. sp. (n. sp., compare to congeners) 379–383; *Macropygia aestivalis* sp. complex (*australis*, *tetramesa*, *hyostoma*, *aestivalis*, *marconis*) (phyl anal., al. locz. data, sister spp., introgress. hybrid.) 493–501; *Etheostoma (Catonotus) (virgatum, basilare* n. sp., *derivativum* n. sp.) (phyl anal. of *Catonotus* [7 spp.], mDNA & nDNA data, *E. virgatum* shown to be 3 spp., key to *Catonotus*) 512–530; *Lithogenes (valencia* n. sp., *villusos*) (n. sp. in previously monotypic subfam., probably extinct) 562–575; *Creagrutus (tuyuka* n. sp., *amoenus*, *kunturus*) (n. sp. sister to *C. amoenus* & *C. kunturus*, phyl. notes) 583–587; *Hisonotus insperatus* n. sp. (n. sp., compare to congeners) 588–593; *Cottus (hypselurus*, sp. cf. *hypselurus*) (phyl. anal. indicates 2 spp., mtDNA data) 624–627; *Petromyzontiformes* (the 18 parasitic spp.) (phyl anal., determ. of monophly & sister groups, morph. charcs.) 687–703; *Danio* (sensu lato), *Bradydanio* (phyl. anal., *Danio* paraphylet., raise *D. devario* to genus *Devario*, several *Danio* spp. chngd. to *Devario*, *Bradydanio* syn. to *Danio*, sister groups, morph. charcs.) 714–728; *Gambusia clarkhubbsi* n. sp. (n. sp. compar. to congeners) 783–788; *Plethodontohyla coronata* n. sp. (n. sp. compare to rels.) 789–793; *Cichlasoma scitulum* n. sp. (n. sp., compare to rels., phyl. notes, 'C. facetus' sp. group) 794–802; *Lumpenopsis (clittella* n. sp., *pavlenkoi*, *tricellata*, *hypochromis*) (n. sp., rediagnose *Lumpenopsis* synon. *Allolumpenus*, key to spp.) 803–809; *Sympodus (bathysphilus* n. sp., *woodmasoni*) (n. sp., compare to congeners, reidentify most *S. woodmasoni* specimens from Indo-W. Pacific as *S. bathysphilus*) 810–817; *Liparis (adiastolus* n. sp., *rutteri*) (n. sp., compare to closest rel., *L. rutteri*, rediagn. *L. rutteri*, specimens of

L. rutteri from Washington southward are all *L. diastolus*) 818-823; *Cyphotilapia gibberosa* n. sp., *frontosa*) (n. sp. from previously monotypic genus, compare b/w. spp.) 824-832; *Rhombus cocosensis* = *Asterorhombus cocosensis*, *Engyprosopon mozambiquensis* n. sp. (holotype of *R. cocosensis* found, is actually *A. cocosensis*, n. sp. name for specimen misident. as *A. cocosensis*) 833-837.

TASTE, *Dicamptodon tenebrosus*, *Oncorhynchus clarki* (1st yr. salamander larvae palatable to trout) 402-407. **TEMPERATURE**, *Menidia peninsulae* (temp.-depend. sex determ.) 155-159; *Aegistodon piscivorus leucostoma* (temp. & photoper. effs. on testost. peak timing, implics. for northern range limits) 231-240; *Dasyatis sabina* (very wide thermal toler.) 315-325; *Chrysemys picta marginata* (spring temp. aff. reprod. seas.) 326-336; *Chrysemys picta* (nest-site temper. choice not rel. to egg size) 366-372; *Sauromalus obesus* (= *ater*) (popn. diff., in color ptn. conspicuousness not rel. to thermal factors) 481-492; *Pseudotriton ruber* (diffs. b/w. aquat. & terrestri. locom. rel. to temp. & body size) 704-

713; *Podarcis muralis* (anti-pred. response depends on intens. of pred. & refuge temp.) 899-905.

TOXICITY, *Crotalus oreganus concolor* (highly toxic venom in juvs. & adults) 769-782.

VISION, *Metriacalma* (*zebra*, *benetos*, *barlowi*) (female mate choice in spp. flock, cues are visual) 181-186; Hawaiian coral reef fishes (195 spp., 49 fams.) (ocular transmission, vis. pigments, UV sensitiv.) 433-454, (coral reef environ. light, microhab. diff., rel. to vis. ecol.) 467-480; Hawaiian coral reef fishes (51 spp., 19 fams.) (wavelength of color ptns., UV color not rel. to UV vis. sensitiv.) 455-466; *Petromyzontiformes* (the 18 parasitic spp.) (var. in rods & cones rel. to adult beh.) 687-703.

WEBERIAN APPARATUS, *Chanos chanos* (devel. of anterior vertebrae very diff. than in otophysan Web. app.) 175-180; *Pellona harroweri* (otophysan clavus-trum homolog. to access. neural arch of lower teleosts) 838-845.

